VESLING, J.

Wanting
Plate 6
Plate 7 + text leaf
Text to plate 11
Plate 21.

Bibliotheca Anatomica Vol: 2. : in 12. Cap

THE ANATOMY OF THE Body of Man:

Wherein is exactly described every Part thereof, in the same Manner as it is Commonly shewed in Publick *Anatomies*.

And for the further help of yong *Physitians* and *Chyrurgions*, there is added very many *Copper Cuts*, far larger than is printed in any Book written in the English Tongue.

Also *Explanations* of every particular expressed in the Copper Plates.

Published in Latin

By *Joh. Vesslingus*, Reader of the *Publick Anatomy* in the most Famous University of *Padua*;

And Englished

By *Nich. Culpeper* Gent. Student in Physick and Astrology, living in Spittle-fields neer *London*.

LONDON:

Printed by *Peter Cole* in *Leaden-Hall*, and are to be sold at his Shop, at the sign of the Printing-Press in Cornhil neer the Royal Exchange. 1653.

TO HIS WORTHY FRIEND

Samuel Hyland Esquire; *Nich. Culpeper* wisheth encrease of Grace in this World, and a Crown of Glory in that to come.

Worthy Sir,

IT might seem a strange Speech (had it not had a private interpretation) that of *Tiresias* the Prophet, quoted by the Poet, who answered *Liriope*, enquiring of him, Whether her son *Narcissus* should be long lived or not? he replied, He should *if he knew not himself*; an answer as strange as it was obscure: for that Learned and wise *Greek*, held, *That the knowledg of a mans self was the first Step to vertue*; and sad experience witnesseth that many in our daies have been ruinated for lack of it, but unhappy *Narcissus* (if the *Poets* say true) fell inammored on his own beauty, and so perished. If it made any thing at all to my present purpose, I could quote you what many other Histories say of him; however the Moral of it (if rightly considered) may give a check to such, who pursuing after shadows, lose the substance: As for the Speech of *Tiresias*, if it be taken in a general acceptance, it will be found as false as what is falsest, the knowledg of a mans self being of all Natural knowledg the most profound and most to be desired, for he that knows himself aright cannot but know all the world, because he is an Epitome of it; Knowledg was that which *Solomon* desired when God gave him all the world to chuse in, and bad him ask what he would have, and he would give it him, as you may reade 1 *Kings*, 3. he said, *Lord, give thy servant an understanding heart that he may judg between good and bad: And the speech pleased the Lord that* Solomon *had asked this*

thing: And God said unto him, because thou hast asked this thing, and hast not asked for thy self long life, neither hast asked riches for thy self, neither hast asked the life of thy enemies, but hast asked for thy self Knowledg to discern judgment; Behold, I have done according to thy word, Lo, I have given thee a wise and understanding heart, so that there was none like thee before thee, neither after thee shall any arise like unto thee; And also I have given thee that which thou hast not asked, both riches and honor. It seems God rewards those with transitory things which seek knowledg of him in the first place, and if so, how will he reward those that labor what they can with might and main to hide knowledg from their Brethren and fellow Creatures? Indeed those that are used to behold and view the Nature and Reasons of things, may easily perceive, not only by the inward Gifts and Endowments of mans Mind, but also by the outward Shape of his Body, far passing and surpassing all other living Creatures, that he was made for some notable end and purpose above them: This the *Poets* themselves could and did discover.

Pronaq; cum spectent animalia cætera terram,
Os homini sublime dedit, Cœlumq; videri
Jussit, & erectos, ad sidera tollere vultus.

And whereas others see with down-cast eyes,
He with a lofty look did man indue,
And bad him Heavens transcendent glory view.

It was a most Divine Speech of the *Poet* indeed, Man was made with an erected face to admire at the glory of the Creator; a man shall seldom hear a truer word in the Pulpit, so that it is palpable that man was not made for Pleasure, nor Honor, nor enough of needful outward things which they commonly call Riches, which the men of this Iron Age look after in the first place, though they be indeed the last and lowest part of the world; they are necessary servants to a man, and as servants they are to be used; and whosoever is respected in this world for his riches sake, he is respected for his servants sake, and not for his own: and indeed neither the Phylosophers of Old, nor yet the Men of our Daies could ever make a true definition what

Riches

Riches was, or at leaſtwiſe ſuch an one as could pleaſe me: *Ariſtotle* held Riches to be enough of things needful, but if that be true, then a Beaſt is as rich as a Saint. The *Stoick* Phyloſophers held riches to conſiſt in having enough Earth and Air, but if that be true, how ſhould a man do for Victuals? this preſent world holds riches to be enough of Gold and Silver, but what one of their enoughs is I know not, nor (I am confident) themſelves neither.

Creſcit amor nummi, quantum ipſa pecunia creſcit.
——— the event doth prove
As Riches doth encreaſe, ſo doth its love.

The more Riches men have, the more they deſire, and they never know when they have enough; for if a covetous man had as many Needles as *Pauls* would hold, and as many Bags of Gold as all thoſe needles would laſt ſtitching, they would never be contented: beſides, if riches conſiſt barely in the enjoyment of money, then that man which *Pliny* (when *Hannibal* beſieged *Caſiline*, and there was a ſore famine in the Town) quotes, would be accounted a very rich man who ſold a mouſe for two hundred pence one day, and died himſelf for lack of food the next.

But worthy Sir, It is not Riches I treat of in this Book, but Knowledg, and particularly the knowledg of a mans Body: I will not ſtand here to prove how much the exact knowledg of the Body conduceth to the mending or marring of the internal Faculties or Endowments of the mind, for that were but to trouble you in the midſt of your buſineſs amongſt your many Imployments, both private at home, and publick abroad for the good of this Nation, the laſt of which hath made your Name precious in the eyes of all honeſt people: neither ſhall I ſpend time in making an Apology why I appear in print in this Nature wherein I have ſo many Predeceſſors in the Engliſh Tongue; the reaſon is clear, Some of them are too large, others too ſhort, none of them have the Demenſions of Mans Body ſo exactly cut in Copper as you ſhall find them in this Book, wherein, as in a looking Glaſs, you may ſee man turned the wrong ſide outwards, and all his internal parts laid open to you view, where-

by your ſpirit may be even raviſhed in the conſideration of the Wiſdom and Power of that God who hath made man in ſuch an abſolute form, ſo accurate in all his delineaments; if ſuch be the Creature, what is the Creator?

Laſtly, Let me crave pardon, and I hope I ſhall not be denied it, in preſuming to ſtamp your Name in the beginning of it: Truly your reallity to the good of this Nation was ſuch, and ſo ſtill continues even in that crooked and perverſe Generation in which we live, that I knew no other way how to ſhew forth a thankful mind to you than by doing as I have done: If it be accounted a fault, let it be venial, and let an honeſt intent find ſooner entertainment with you than a hare-brain'd action.

The God of heaven and earth bleſs you with the Bleſſings both of this Life, and that to come, that you may go on in the good work as hitherto you have done, even till ſuch time as it pleaſeth him to let us enjoy one deſired Liberty. Sir I am

Yours unfainedly

NICH. CULPEPER.

TO

TO THE READER.

Courteous Reader,

IT *is no hard matter for one that hath been trained up in the School of* Xermes, *and is any thing skilled at all in the* Egyptian *Learning* (Xermetical Phyloſophy *being far more ancient than* Galens *Method*) *I ſay it is no hard matter for one that hath been trained up in that Learning to prove that the life of all things is all one with it ſelf in all perſons, and that the difference between ſick perſons and healthful, wiſe perſons and fools, vertuous perſons and vicious, if you will take vertue and vice in a Phyloſophical ſence, lies in the temper of their Bodies; neither is it any ſmal ſtep to the knowledg of the temper of a mans Body, to know the exact deliniaments thereof in an Anatomical way; a man muſt know in what part of the Body a Diſeaſe lies, and the place, and quality of that place alſo, before he knows how to remedy it, if* Galen's *Art be true; and I would willingly teach* Galeniſts, *if I thought they were not too proud to learn; I would fain teach fools wiſdom if they were but willing to learn; for why may there not be a way left in Nature to bring ignorant people to knowledg, as there is to bring mad people to a ſober life? which the vulgar commonly call,* Rational. *That Madneſs is a Diſeaſe of the Body, all know, neither is it unknown but to few that Folly is a Diſeaſe of the Mind, and yet it is Epidemical at this time, the more is the pity; it were eaſily proved if a man would go about it, That it is the Body afflicts the Mind; for it is abſolutely impoſſible the Mind ſhould afflict the Body, the Mind being Ætherial, Immortal, and no way ſubject to corruption: I care not greatly if I ſpend a little time and pains in clearing this to you, ſo far as will ſerve the turn to ſhew the truth of it, and not to exceed the limits of an Epiſtle.*

The Divine and Immortal Mind proper to man is wise, and alike wise in all men, being one and the same in all points in all men; and this is easily proved because God from whence it comes is one and the same; the difference then, is when it is divided and sent into different places. It was excellently spoken of that Noble Polonian, *saith he, If you lay diverse Colors round upon a Table at a distance one from another, imagine White lay here, and Green there, and Red there, Blue there, Salt in another place, Allum in another; now if you take a pot of fair clear Water, and powr down in the midst of them, that which runs through the red Color will be red, and that which runs through the blue Color will be blue, and that which runs through the Salt will be salt, and that which runs through the Allum will be Allumy, &c. and yet the water which is powred down amongst them is one and the same.*

Take another familiar Example or two, for things are better cleared by Examples than they are by themselves: There are innumerable kinds of Lights in the world, that differ in form and bigness, according to the matter that receives them; there are some great fires, and some little ones, some burn cleer, and some are smoky; there are some great Candles, and some smal ones, and some Torches, and yet the Sun from whence all these receive their light, is of it self all one and the same in all places. Take another Example, which shall bring the matter a little closer home to the point, As the Sun of himself ever shineth and seeth all things, unless his beams be stopped by a cloud or some other thick matter; even so the Mind of Man considered alone by it self, knoweth all things, but being entangled in the Body, and darkned by its cloudiness and infirmities, it can see nothing without the leave and help of the Body; this course then the Mind is fain to take, considering her self she cannot step forth out of the Body, nor range abroad to discern the Idea's of things as they are in themselves, She is fain to take the demonstrations of things as she can receive them from the Body though they be in never so poor and deceitful a way.

1. *She is forced to imploy the outward Spirits that keep their residence in the edg and border of the Body, I mean the five Sences,* Seeing, Hearing, Smelling, Tasting, *and* Feeling; *neither can these operate without their proper Instruments,* viz. *The parts of the body where they lodg, viz.* Seeing *cannot see without the* Eye, *nor* Hearing *hear without the* Ear.

2. *These bring in tidings to the Mind,* viz. *The Shews, Shapes, and Idea's of things; yet cannot the Mind of man understand these without an Interpreter, therefore are there inward Beams or Sences which lodg in the*

Brain,

Brain, three of them by Number, which take these tidings from the external sences, and represent them as it were in a glass to the Mind, to wit, Apprehension, Memory, *and* Judgment; *then the mind laying them altogether, and comparing one with another, judges of them, which is good, and which is bad, which is fit, and which is not fit to be done: Now if these Messengers of the Mind, or the places of the Body where they lodg, be foul, or gross, or thick, they give either dull, or false information to the Mind; a Looking-glass if it be so corrupted will do the like to the face of the Body: Thus I think it sufficiently proved that the afflictions of the Mind have their Original from the Body: And besides I have taught you a little* Phylosophy, *though it belonged nothing at all to my present purpose. I hope you see by this time how beneficial the knowledg of the Anatomy of a Mans Body is to the rectification of the Endowments of his Mind; indeed, to his well-being both in this world, and that to come, if he mind vertue here, and intend to inherit happiness hereafter.*

How requisite it is to the Cure of the Diseases of the Body, every one can tell you; and therefore I may hold my peace and not spend time in proving the Crow to be black, or the Swan white. Only this I desire you to take notice of, and so I conclude, That whereas I have been reputerated many times for being Critical in my Writings, I have altogether forborn it here, though I confess I shall not please every body in this Translation, whether a man go at one side of the street or the other the dogs will bark at him; and the man in Æsops Fables, *whether himself rid, or his boy, or both of them, or neither of them, could not please the next he met.*

As for Veslingus *the Author of this Work which I have here Translated, he was (and for ought I know, or can hear, is still) the publick Reader of the Anatomy Lecture at the famous University of* Padua *in* Italy. *I confess I differ in Opinion from him in some few particulars, and but in few, especially where he makes the Heart the fountain of Blood, as also the Veins that carry it, wherein it is apparent that he drank too deep of* Aristotles *spittle: I confess I passed it by in silence; diverse are of that Opinion; let them give me leave to use mine, as I have given them to use theirs. As for the Brass Cuts, they are performed very exactly, far exceeding any that ever were printed in the English Tongue, inferior to none in the world. Truly, I wish this poor* Nation *much good by this Work, that the Lord would open their eyes, that they might see the truth and themselves, and let them rest confident, That whilst I am amongst the Living, I shall never cease to do them good according to my power.*

The Contents of the CHAPTERS.

Joh. Veslingus to the Reader.

DEmetrius *sacked* Rhodes, *and the Suburbs being taken, he threatned the City with Fire and Sword; they sending an Embassador, entreated him, that he would not burn the Table of* Protogenis, *placed upon the Wall; he readily answers, That he would sooner burn the Image of his Father, than such a piece of Workmanship; for the Workman had painted* Jalysus *one of the* Heroes *of* Rhodes *in a Table, to wit, the Image of the Body drawn with a Pensil.*

What place then (my Reader) should the Context it self of the Body of Man, his inward Parts and Adornments, have in our minds, when Demetrius *was so chary of only the Shadow? Truly, the very same which the Workmanship of God ought to have, he being a delicate Epitome of the whol world, by which alone the Eternal God shewed what he was able to do in the Universe.*

Men famous for Wisdom in Ancient times were ravished with contemplation of this; although from the Age of Alcmæon *even to* Diocles, *they were content with the curious Inspections only, and buried the Mystery in silence, and left nothing to posterity, till the exquisite Knowledg of Mans Body inflamed Man with a greater desire of Study, brought it out of darkness into light, as the most solid Foundation of that part of Physick called* Physyology: *Amongst the Ancients,* Galen *bears away the Bell in this part of Study, which is to be found in his Praise-worthy Works of Dissection; afterwards in this latter Age, the Precepts of this Art being rectified, diligent men encreased the Art of Anatomy of the Body of Man, with profitable Observations; then it came into great Volumns, explaining the Functions confusedly, and answering needless Questions; also Figures were added cut in Copper, to feed the Eyes of those that had not opportunity to see the Dissection.*

In this so famous Anatomical Light, I have known not a few, profit but little by so great Labors, being wearied out with the bulk of the Books, and miserably intangled in the snares of Controversies; another spends all his time in contemplating the Figures, as though he were beholding the Siege of Troy, *and being ignorant of the Substance, rejoyceth in the Image of things.*

To recal those Errors, I framed this smal VVork, in the manner as we shew it in publick Dissections of the Body of Man: I avoided Controversies, which belong rather to Contemplatists, than the Theaters of Anatomists, which were built to behold, not to dispute in. I was least of all solicitous about the Figures; for although very many ingenuous men have been very exact in them, yet he labors in vain, that labors to find the natural position of Parts, their magnitude, order, hardness, softness, and as Celsus *saith, their smoothness, process, recess, insertion into another, or reception of another into themselves, accurately by them.*

What ever it be, we would have it brief, and not enlarge it with many words, imitating that of Salustius *of the* Carthaginian *Law; it is better to speak few things here, then to pass by many things with silence, seeing such things as are prescribed to yong men of the Body of Man, are scarce better done any where, than what here is laid down to faithful Eyes; and yet if you regard only the Speech, you will deny, as* Apelles *did of the Table of* Protogenis, *that the work hath any grace; or if you regard the novilty of the stile; both of them I easily grant you, being not desirous of Popular applause.*

I propound the History of the Parts of the Body shewed in Dissections; for what profits it to garnish it with flourishes, which appears without spot in its Native Beauty, being the naked Workmanship of Nature: Neither thought I good to abstain from the words already in use, lest I should seem to draw a cloud over other Mens Works, and darken the way to the Temples of Wisdom *and* Æsculapius. *Most of it I drew out of the common Fountain, but the Manuduction is drawn out of my own Vessel. I had to my Master, a famous man,* Fabricius Bartoletus *of* Bonona, *Chief Physitian to the Duke of* Mantua.

If you regard the Order, you are beholding to me for that; I digested it into so many Chapters, as publickly it is demonstrated in Anatomies, and the Series of every Chapter is in the same manner as it is shewed to the eye in publick Dissections; In the Breast I shew the Adductor of the Shoulder, and the Muscles of the Scapula *called* Serrati, *before the Intercostals,*

Intercostals, the Lumbal Muscles after the Extenders of the back, the movers of the Scapula *before the muscles of the head and back: The reason that I joyn the Tongue with the* Larynx, *is it's singular nexure with the* Os Hyois, *and the* Os Hyois *with the* Larinx; *the bones of the Limbs are set before the Muscles, seeing the greatest part of them move the bones: to both I add the Nerves, Arteries, and Veins, which the Divine Creator hath made common with the bones and muscles. I did not treat of the Nature of similary parts by themselves for brevity sake, seeing that belongs rather to Physiology, and without Tautology could not here be treated of.*

This I intreat of thee who ever reads this Work, That thou wouldest give thy mind as well to pardon failings, as to know the truth, if thou meetest with any, caused either through forgetfulness, or non-understanding: my serious intent was to lead such young men as are studious in Physick into the Knowledg of Anatomy; if my endeavors want strength, thou canst not in equity deny me pardon, seeing thou thy self maist run upon the same Rocks in other difficulties. Farewel

The Names of several Books printed by Peter Cole, *at the sign of the Printing-Press in Cornhil, by the Exchange,* London.

Five several Books, by Nich. Culpeper, *Gent. Student in* Physick *and* Astrology.

1 A Translation of the *New Dispensatory*, made by the Colledg of Physitians of *London*. Whereunto is added, The *Key to* Galen's *Method of Physick*.
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3 *Gospel-Conversation*, on *Phil.* 1. 17. Wherin is shewed, 1. That the Conversations of Beleevers must be above what could be by the Light of Nature, 2. Beyond those that lived under the Law, 3. And suitable to what Truths the Gospel holds forth. To which is added, *The Misery of those Men that have their Portion in this Life only*, on *Psal.* 17. 14.
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6 An *Exposition* on the eighth, ninth, and tenth Chapters of *Hosea*.
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5 The Spiritual Actings of Faith, through Natural Impossibilities.
6 Evangelical Repentance.
7 The Spiritual-Life, and In-Being of Christ in all Beleevers.
8 The Woman of Canaan.
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The Anatomist Anatomized.
King *Charls* his Case, or an Appeal to all rational men concerning his Tryal.
Mr. *Owens* stedfastness of the Promises.
Mr. *Owen* against Mr. *Baxter*.

AN ANATOMICAL TREATISE.

CHAP. I.

Of the common Coverings of the Body.

IF you disdain not to turn thy eyes and mind to the Corps of Man Artificially dissected, whether the Profession of Wisdom or Physick delight thee, I promise thee here something worth thy labor and not to be despised, for there is not the least nor most abject part of Man, but by its admirable structure thou maiest know him that made thee, to be most wise, most powerful: Thou shalt find out the causes of all the actions, the consent and concord of thy whol Body, the Foundation of Health and Sickness, thou maiest the better apply Remedies to afflicted parts; and in the time when Nature calls for remedy, thou needest not be hurried on with rashness, nor retarded by fear.

In the Body of Man, both [a]*Ventricles* and *Limbs* are to be heeded; the common name of *Limbs* comprehends both Hands and Feet: we cal those notable Cavities of the Body, *Ventricles*, in which Nature hath placed diverse parts dedicated to diverse actions, to settle their abode in. Of these are three.

a the stomach, or any round Concavity in the Body —

The first, which is the lower, is called the [b]*Abdomen* and is internally compassed with the *Pfritonæum*, it is called the *Abdomen*, because it hides and involves all those Bowels which are ordained for the preparation of the nourishment of the whol Body, the begetting of Children, the producing and cherishing of the Seed.

b that part of the Belly which Contains the naturall bowels

The second, which is the middle, is bounded about with the *Pleura*, It is in the Fountain of vital heat and in it are the Lungues.

The third, which is the highest, is included in the head, and stoutly defended by the Skull; in this, *Plato* placeth the Cœlestial part of Man.

We, becauſe we would avoid putrifaction, begin the Diſſection at the lower *Ventricle*, or *Abdomen*, whoſe fore part, which is next the lower Cartilages of the Ribs, the ancients called *Hypochondria*, and is divided into the right and left; But the other, we of Modern times, very fitly call that part which is next the Stomach and the uppermoſt Guts, *Epigaſtrium*; but that which contains the lower part of the belly, even to the groyn and privities, *Hypocaſtrium*, the middle, between the *Epigaſtrium* and *Hypogaſtrium*; we call the region of the Navil the back part of the *Abdomen*, the upper part of it is called the Loyns, the lower part the Buttocks.

Of the parts of the *Abdomen*, ſome are common to the whol Body, ſome proper to its ſelf; the common parts are the skin, ſcarf-skin, fat, and fleſhy Membrane.

The Skin is a Membranous covering of the Body, drawn over the outward parts, defending them from injury, and giving judgment of tangible Objects: I call it a Membranous covering, becauſe the ſubſtance is the ſame with a Membrane, and it is ſtretched abroad like it, yet it differs from a Membrane in Temperament, conformation and office; it takes its original not from Blood, nor yet from the Veſſels, but from the Seed, and this, the firſt radiments of the *Embrion* in the womb teſtifies, which Nature compaſſeth about with a thin skin, even ſo ſoon as it is compacted: Hence alſo like other Seminal parts, even in a Blackmoors, under the black thin skin, it is white; neither when it is loſt doth Nature reſtore again the ſame, but another ſubſtance like it, which is called a *Callus* or Scar.

It receives its quickneſs of ſence from the Nerves, not only the extremity of which, but alſo diverſe ſmall branches, are ſpread abroad in it, as is very cleer in the third and four pair of Nerves which paſs to the face and the ſixt pair which paſs to the Arms. It receives alſo many ſmall veins and Arteries that ſo it may be furniſhed with blood for nouriſhment and vital ſpirit for quickning, that the coldneſs and dryneſs of it may be allayed, that part of of it about the *Abdomen*, is ſupplied by veins and Arteries from the *Epigaſtricks*, *Lumbals*, and *Mammary* branches.

The Habit of the skin is altogether different, according to the variety of temperament, age, ſex, and region: The skin on the top of the head is thickeſt, that on the ſides thin, that on the face and palm of the hand thinner, and that of the lips thinneſt of all; that on the tops of the fingers is mean, that ſo the ſence of touching might be the more perfect. It hath very many paſſages or holes in it, of which ſome are wide, as the mouth, noſe, ears, eyes, and privities, &c. ſeing they are neceſſary either to receive in food, or caſt out excrements, others are ſmall and innumerable by which ſweat and fuliginous vapors tranſpire.

It is in colour naturally white, and ſticks looſly to the fat that is under it, ſo that in ſome places being cut, it may be blown up from it, as hath been tryed by ſome in that barbarous faſhion of cuting Leproſies; It ſticks faſt to the fleſhy membrane of the fore-head, as alſo to that of the ſoles of the feet, and the palms of the hands: So that the motion of thoſe parts, it is drawn into wrinkles together with it, by which as by

Hieroglyphicks

Hieroglyphicks: the curiosity of mans brain hath drawn indications of things to come.

A famous thin skin covers this skin externally, which the Greeks very acutely call *Epidermis*, the Latins *Enticula*, and we Scarf-skin; it takes its original from the dewy moisture on the outside of the skin, which is made thick into that form, partly by the gentle and nourishing heat of nature, partly by the driness round about, whence it comes to passe that the *Embrion* being yet very tender, yet this though very soft is found about it; it obtains its firmnesse by age, even such a firmnesse that sometimes it restrains the excrements that pass through the pores of the skin: It is extended all about the body where the skin is, and sometimes through hot and fiery vapors that pass through the pores, you may see it divided; as in such cases when we *English* say the skin pills off: It is all together void of life and sence, and yet so firmly knit to the skin that it can hardly be seperated.

Neither is the use of this Scarf-skin (though it seems so smal a busines) smal, for without this could not the pores of the skin be covered, the continual moisture of the body restrained, the body be made able to endure heat and cold, nor the limbs be clensed of durt and filth.

Serpents seem yearly to cast off this Scarf-skin; but the scaly skin is not a true Scarf-skin, but a thin membrane made of viscous slime and filth, and the driness of the air about, the same happens to men in feavers, especially upon their tongue.

Underneath the skin is the fat, which is an unctuous or greasy substance of the body, produced out of the Oyly substance of the nourishment, which lying like a mat about the body, not only defends it from the injury of cold, but also restrains the immoderate dissipating, or scattering of the internal heat; therefore in the Child even when it detained in the womb, it begins to grow, yet is it more in quantity, and thicker after it is born. Art imitates Nature in this, in that it puts Oyl upon Liquors which are full of Spirit, least the Spirit should exhale.

The body is universally surrounded with it; if you except the Eyelids, the lips, and the Privities of men: the office of which would be vitiated either by needless weight, or superfluous moisture: The fat is thickest about the *Abdomen* and loyns, mean upon the breast, and thinnest upon the head, nature providently regarding and providing for the want of all places: the fat considered in it self (*Quatenus* fat) wants both life and sence, yet it receives both, from the *Mammary*, *Lumbal*, and *Epigastrick* branches of the arteries, and the strings of the nerves which are mixed with it.

The matter it self from which it is produced shew its temperament to be moderately hot, mixed with an aerial moisture: Its effects are evident, *viz.* moderately to heat and attenuate, and more plentifully to moisten. Also it is well known to profit much in pains of the sides and joynts, to keep the hair from falling off, and to take away the deformity of scars. It grows most about the hottest parts of the body, and cannot positively take its original from cold: that kind of fat which is called *Pinguedo* is softer than that which is called *Adeps* (I suppose *Adeps* to be

that which we Englifh vulgarly call Suet) and as it grows with more difficulty, ſo it melts without eaſe. It is joyned to the skin and to the membranes underneath it; and beſides the foregoing uſes, it moiſtens and refreſheth thoſe parts of the body appoynted for violent motions; laſtly it is placed in the intervalls of the Muſcles, to better their motion, and encreaſe their comlineſs.

Underneath the fat of the whole body is ſtretched out the skin, which the Latins call *Membra Carnoſa*, and *Panniculus Carnoſus*. I know not what better verſion to give it then a [fleſhy membrane] Although in the *Abdomen* of a man ripe in years, it carries no fleſhy appearance at all, yet about the fore-head, the Neck, the hinder part of the head, and the Ears, it hath an intertexture of Muſculous fleſh, and therefore it ſerves not only to keep the Fat in its due place, but alſo to divide one Muſcle from another, and all of them from the other fleſh; It obtains veins, Arteries, and Nerves from the neereſt branches to it; it is ſtretched out over all the parts of the body, even where the uſe of the Fat is either very little or none at all.

Its conſtitution is not alwaies ſingle; for in fat bodies you ſhall find it often double, ſometimes manifold in reſpect of temperature: it is cold and dry, which coldneſs and dryneſs is quallified by the neerneſs of the fleſh and Fat, it is exquiſite in ſence, anoyed by ſharp vapors, and ſuddain ſhakings, it ſticks cloſe to the Fat, to the Muſcles, to the ligaments of the bones, at which places it may eaſily be found.

Place here the Table of the firſt Chapter, which hath the Number 1. *at the corner of the braſs Plate.*

CHAP

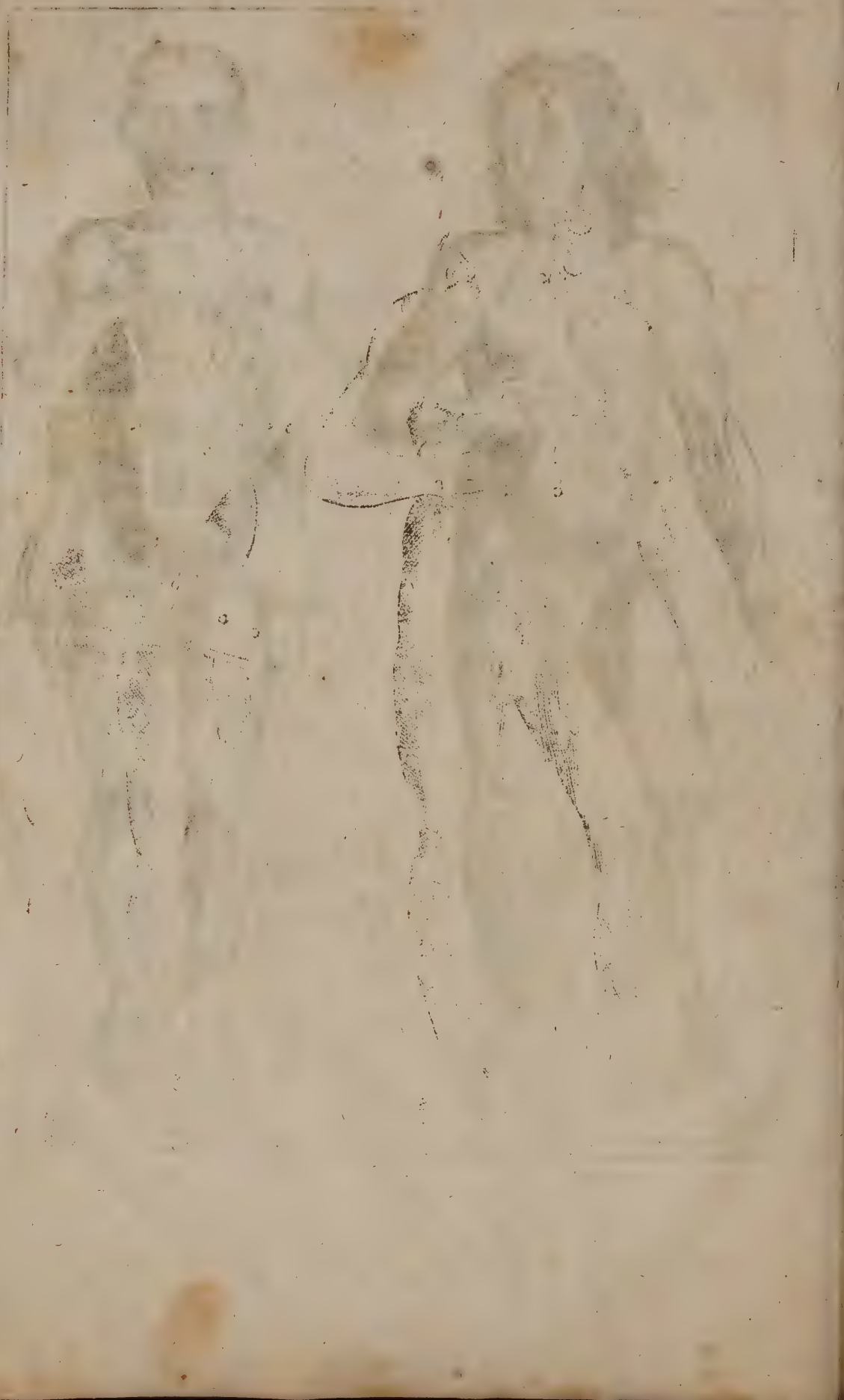
AN EXPLANATION OF THE TABLE OF THE FIRST CHAPTER.

The first Figure shews the Effigies of a living Man, in which, not only the external parts of the *Abdomen*, but also the Veins under the Skin which are conspicuous are represented.

A The right Hypochondria.
B The left Hypochondria.
CC The Epigastrium.
DD The Bowels.
EE The Hypogastrium.
FF The Groyns.
G The Region above the Privities.
H The Vein of the Forehead.
I The Vein of the Temples.
K The external Jugular Vein.
L The cephalick vein of the right Arm.
M The basilick vein of the right Arm.
N The middle or common Vein, which is not in the same place in all Bodies.
O The cephalick vein of the left Hand.
P The vein of the left Hand, called Salvatella.
Q Q The Vein Saphæna descending.
R R The Vein Saphæna in the Foot it self.
S S The Sciatick Vein.

The Second Figure expresseth the common coverings of the Body of Man, and the Muscles under them laid open.

A A The Scarf-skin.
B B B B The Skin.
C C C C The Fat.
D D D D The fleshy Membrane.
E E Part of the pectoral Muscles laid open.
F F F Certain beginnings of the Muscles called Serrati antici majores.
GG HH II The Muscles of the Abdomen obliquely descending.
G HH Their toothed beginnings.
IIII The tendon of the oblique descending Muscles, under which the right Muscles of the Abdomen with their Nervous inscriptions appear.
K K The white line of the Abdomen.



CHAP. 2.

Of the Bones and Muſcles of the *Abdomen*, and of the *Peritonæum*.

THe parts which are properly attributed to the *Abdomen*, are either external (which deſervedly bear the name of parts containing) or internal which we call parts contained; amongſt the external are numbred the Bones, the Muſcles, and the *Peritonæum* connexed with them.

We begin with the Bones which are the drier parts of the body of man, and the harder, ordained for the ſtability of the whole body, the firmneſs of the joynts, and the ſtrength of voluntary motion.

Their firſt ſubſtance, they have from the ſeed, and therefore they are all Carthilaginous at firſt, and grow ſolid in proceſs of time, they are longeſt before they grow bony at the ends, which the Greeks call *Epiphyſes*, and the Latins *Appendices*.

They are covered with a notable membrane which is called *Perioſteum*, of the veſſels they receive in, the Veins are evident, the Arteries more obſcure, and the Nerves obſcureſt of all; and yet the pain which is felt not in a few places, when they are laid open by the hand of the Chyrurgion, manifeſteth, that the Nerves penitrate not only to the external membrane, but alſo into the holes of the Bones themſelves.

There is a mighty diverſity both in their magnitude and figure, ſo that they ought all to be handled in particular, and not in the univerſal: They are in number above three hundred, a great part of them are bowed into *Sinus*, or ſtick out in heads, which nature hath covered with a ſoft cartilage as it were with a cruſt; that ſo the bowing of the joynts might be the ſafer and readier: part of them have cavities like long pipes, part of them have ſmall holes like Sponges, as the preſent bones of the *Abdomen* have; all of them abound with marrow, or with a juyce like marrow, whereby their cold and dry nature is not a little mitigated.

The joyning of the Bones is made the ſtronger both by Carthilages and Ligaments, of which the Cartilages are Spermatical parts uſually joyned to the Bones, but not ſo hard, that ſo the joynts may bend the better: The Ligaments are Spermatical alſo, and are ſofter than the Cartilages, although they are more or leſs ſoft according as they are round or flat: It is very fitting we ſhould take notice of the manner of their conjunction or joyning ſeverally.

The Bones of the *Abdomen* are but few in number, but of great bulk, occupying the lower and hinder part of it, in the fore part they are not neceſſary, leaſt they ſhould hinder the diſtention of the belly: Theſe be the *Vertebræ* of the loyns, the *os Sacrum*, *Coccix*, that which the Ancients

called the Bone without a name, vulgarly called *Ischium* or *Coxa*, which containeth the *Ilium*, *Coccendix* and the Bones of the *Pubis*.

The *Vertebræ* of the loyns are in number five, ordained for the safe passage of the Marrow of the back, and the descending of the Nerves, the inferior are larger than the superior, that they may the better hold up the back, they have various processes which Authors call *Apophyses*, of which two are transverse, four oblique, two superior, and as many inferior, and one acute: the oblique processes especially strengthen the joynts; the transverse and acute, are for the convenience of the Muscles: In the middle cavitiy of the *Vertebræ* the Marrow of the back descends; other lesser cavities are found about the sides, where the *Vertebræ* are joyned, to give passage to the Nerves of the loyns; they are joyned backwards by their obliqne processes, by that juncture which the Greeks call, *Ginglymos*, when there is a mutual reception between them, forwards by *Hormonia*; the rest are joyned by *Syndesmos*, or by the benefit of Ligaments, although they stick but loosly together, least immoderate rigor should make the bowing of the loyns difficult; but this being common to the rest of the *Vertebræ*: I shall passe it by in few words.

Under the loyns is the *os Sacrum*, being notable above all the rest for its thickness and strength, being the Basis of so many *Vertebræs* which are above it; for the most part it consists of six parts, which æmulate the *Vertebræ*, growing narrower by degrees from abroad beginning; all of them being immovable, and in aged Persons seeming to be but one Bone.

Like an appendix to the *os Sacrum* is the *os Coccix* composed of three small bones bowed forward for the more convenient sitting of the man, their joyning together by Cartilages is but loose, so that they are somewhat moved out of their places by the hard travail of women.

On both sides of this follows the *os Ilium*, which is the superior part of the *Coxa*, or Bone without a name. It is large, strong, and with a broad back. The gut called *Ilium* gave the name to this Bone, either because its manifold circulations are neer it, or else because it seems to be propped up by this Bone.

To this is committed the *os Coxendix*, which others call *Ischium*; another part of the *Coxa*, being also thick and firm, it hath a large Cavity like the saucers of the Ancients, into which the globous head of the thigh is placed, and it is joyned to the sides of the *os Sacrum*, firmly with a double tye.

Forwards from this on both sides is stretched out the *os Pubis*, compared to the former; it is thin, and hath a great hole through it, least its weight should hinder the nimbleness of the body: on its extream parts it hath a Cartilage, and it is strongly knit to the next bone of the side, both with a circular and membranous Ligament; neither yet is this knitting so tith but it may (like the former bones we mentioned) give way a little in the strong travail of women.

[illegible]tion of Bones (according to the consent of most Au-
[illegible]vise propounded, if we regard their Natural di-
[illegible] Bodies of Children; for in such, even til
seven

seven years of age, they are manifestly divided, and may be taken asunder; therefore that portion which is the lower, broader, and larger, even to the middle of the *Acetabulum*, makes the *Os Ilium*, the other portion stretched forward from the *Acetabulum*, divided two waies; the superior part makes the *Os Pubis* the inferior, the *Os Coxendix*, which not alone, but with the other two joyn'd with it, make the *Sinus* for the head of the Thigh, and with the *Os-pubis* makes that foremost large hole.

Urgent necessity requires Muscles in the *Abdomen* for the expelling of excrements, to wit, Organical parts, endewed with fibrous flesh, and strong tendons, by which Nature endeavor the compression of the belly and the parts therein contained. Of the Muscles there are five pair, which by reason of the diversity of their Operations, have obtained a diversity of names.

The first are, *Obliquely descending*, and are larger than the rest, and have a very broad Tendon, which goes like two other subjects, *viz.* the *Peritonæum* in men, and the worm-like Ligament of the womb in women, neer to the Groyn: They take their beginning under the great *Musculus Serratus* of the Breast, by unequal or toothlike productions, then they fall back, where the transverse processes of the *Vertebræ* of the Loyns end; in the middle of the *Abdomen* a concourse of tendons being made, they end there, in a certain white line, they are furnished with Veins, Arteries and Nerves from the branches of the intercostals where they come to the breast.

The next pair of the Muscles of the *Abdomen* is termed *Obliquely Ascending*, arising neer the transverse processes of the *Vertebræ* of the Loyns, and the utmost brim of the *Os-Ilium*; rising thence they joyn themselves to the eleventh and twelfth ribs, and after by a doubled tendon they come to the right Muscles of the *Abdomen*, they also end in the white line, they have their Veins and Arteries from the branches of the Veins and Arteries which are called *Musculæ*, whose original is from the *Vena cava* and the great Artery, about their division into the Iliack branches, they have their Nerves from the Lumballs, and the lowermost intercostals.

The third pair are *Transverse Muscles* and have a Membranous beginning from the Transverse Processes of the *Vertebræ* of the Loyns, and passing by the *Os Ilium*, they stick to the *Peritonæum* and end where the other did; they participate of the same Veins, Arteries, and Nerves with the Muscles obliquely ascending.

The *right Muscles* make the fourth pair, in which, by excellent workmanship of the Creator, the *Epigastrick* Veins and Arteries ascend, then these carriers of nourishment and vital heat descend by the internal mammaries neer the Cartilage called *Mucronata*, or through its cleft: The Anastomosis of these Veins is very conspicuous in women with child, and therefore the womb being much stopped, or compressed with great swellings, being stretched from the Groyn up to the Breasts, they resemble a channel, sometimes of the thickness of a finger; They have their Nerves from the intercostals, stretched all along the middle of the *Abdomen*, they are divided into two, three, and sometimes into

four inſcriptions, as it were into ſo many Muſcles, at the Cartilages of the Ribs, and the Cartilage of the breaſt, called *Mucronata* where they riſe, they are fleſhy, and they end in the *Os Pubis* where they are faſtened by a ſtrong and tendinous body.

The Muſcles called *Pyramidales* make up the fifth pair, the figure of which, eſpecially joyned together, being like a Pyramide, gave them their name; they take their baſis from the *Os Pubis*, from which riſing and growing more ſlender by degrees, they admit their tendon into the white Line; they are auxiliary to the right Muſcles, and compreſs the lower parts the more ſtrongly, the ends of the right Muſcles Being fleſhy and broad ſupply the defect of theſe.

But the four greater pairs which we mentioned, bind in the *Abdomen*, for the expulſion of excrements, and alſo help the breaſt to avoid its flegm. An uſe alſo may be given of each of them ſeverally, and no obſcure one neither, ſeing they cheriſh the heat of the Bowels, and ad comlineſs to the part, we might mention the two Lumbal Muſcles here, ſaur and quadratus; but they more rightly belong to the Muſcles of the back.

Amongſt the containing parts of the Abdomen, the laſt is the *Peritonæum*, a Membrane ſo called which compaſſeth the Bowels about; neither doth it only compaſs them, and keep them in, but alſo (by the conſent of no ſmall Authors) inveſteth them with their common skin, by reaſon of the variety of its Scituation; it hath veins and arteries from the *Phrenici*, the Muſcles of the Loyns, the Mammaries and Epigaſtricks; it hath Nerves from the *Vertebræ* of the Breaſt and Loyns, neither is this Membrana ſingle, for about the Reins, Ureters and Bladder, it is manifeſtly double, the forepart of it is thinner, it is thickeſt towards the back, in both places it is ſtrong; alſo by affluxion of humors it ſometimes ſwells to the thickneſs of the skin, ſhewing a double tunicle every where by reaſon of the humors within, being then alike in thickneſs to the Membranes which compaſs the bowels about.

The *Peritonæum* paſſeth not only to the *Gula* of the Veſſels above and beneath, and ſuch as outwardly compaſs about the child in the womb, but alſo to the worm-like Ligaments of the womb: Alſo in the Body of man, its proceſſes are conſiderable, for it gives two tunicles, in which the Spermatick Veſſels and Teſticles are wrapped; It is joyned in many places, both to the parts under it, and the Muſcles neer it to the *Diaphragma*, and the upper *Vertebræ* of the Loyns, from whence it is held to take its beginning.

Place here the Table of the ſecond Chapter, which hath the Number 2. at the corner of the braſs Plate.

CHAP.

THE TABLE OF THE SECOND CHAPTER UNFOLDED.

This Table laies open the Bones of the *Abdomen* in seven Figures: two others, to wit, the eighth and ninth shews the Muscles of the *Abdomen*: The tenth gives you a cleer sight of the Parts, the *Peritonæum* being removed.

FIG. I.

Expresseth the five *Vertebræ* of the Loyns, as they are observed on the fore part.

a a a a *The Transverse Proceß.*

FIG. II.

Laies open to your view, the *Vertebræ* of the Loyns, as are presented on the back Part.

a *The hole for the Marrow of the Back.*
b b *The transverse Proceß.*
c c c c *The oblique Proceß.*
d *The acute Proceß.*

FIG. III.

Represents the internal face of the *Os Coxæ*, as it is united in such as are grown up.

A *Os Ilium.*
B B *Os Coxendix.*
C *Os Pubis.*

FIG. IV.

Demonstrates the external face of the *Os Coxæ.*

A *Os Ilium.*
a a *The Spine of the Os Ilium.*
B *Os Coxendix.*
C C *Os Pubis.*

FIG. V.

Gives the internal view of the *Os Sacrum* divided into six parts.

a a a a *The holes which give passage to the Nerves.*
b *The three parts of the* Coccyx.

FIG. VI.

The same Bone externally to be seen.

a *The hole for the Marrow of the Back.*
b b b *Lesser holes for Nerves.*
c *Os Coccyx.*

FIG. VII.

The Figure which deciphers the *Os Coxa*, as it is observed to be distinct in Children.

A Os Ilium *a little taken from the rest.*
B B Os Coxendix.
C C Os Pubis.
a a *The cleft distinguishing the* Os Coxendix *and* Os Pubis.

The connexure of all the Bones of the *Abdomen*, see in the Table to Chapter 17.

FIG. VIII.

A *The Muscle of the* Abdomen *obliquely descending, in which*
a a *Are the toothed beginnings.*
b b *The Tendon sticking to the white Line.*
B *The Muscle of the* Abdomen *obliquely ascending, in which*
c c c *Its beginning.*
d d *A portion of its tendon which covers the right Muscle.*
e e *The right Muscle of the* Abdomen.

FIG. IX.

A *The transverse Muscle loosed about the beginning, in which*
a a a *The beginning.*
b b *A portion of the* Tendon.
B *The right Muscle of the* Abdomen, *in which*
c *The Beginning.*
d d d *The Nervous inscriptions.*
e *The end.*
C *The back part of the other right Muscle, in which*
d *Shews the Vein and mammary Artery descending.*
e *The Epigastrick vein and artery ascending.*
f *The* Anastomosis *of the veins.*
g g *The* Peritonæum *laid bare from the muscles.*
D D *The Pyramidal Muscles.*
E E *The Proceß of the* Peritonæum *descending to the Cods.*

FIG. X.

A *Part of the Pectoral Muscle detected.*
B *The* Sternum.
C *The Stomach being something hid by the Liver.*
D *The Liver.*
E *The* Omentum *in its Scituation.*
b *A portion which sticketh to the Liver.*
c c *A portion which is knit to the bottom of the Stomach.*
d d d *The remainder of the* Omentum *as it lies upon the Bowels.*
F F *The Bowels in their scituation.*
G *The Navil Vein.*
H *The Ligament of the Bladder composed of the* Urachos, *and the two Navil arteries.*
I *The bottom of the Bladder.*
a a a a *The* Peritonæum *divided.*

III

I

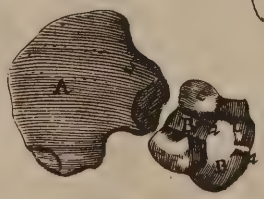
IV

V

II

VI

VII



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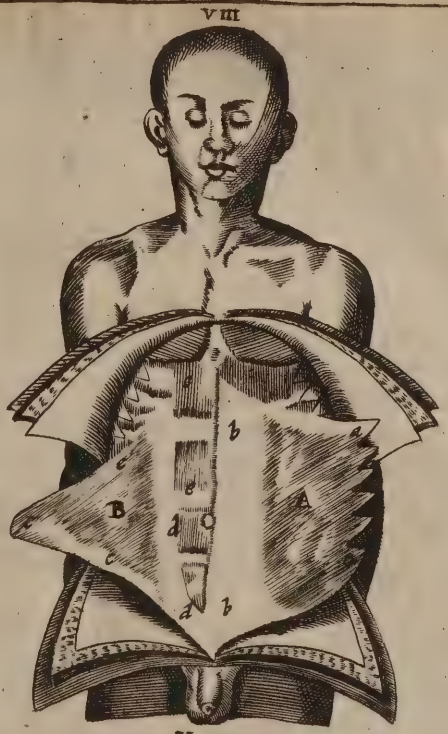

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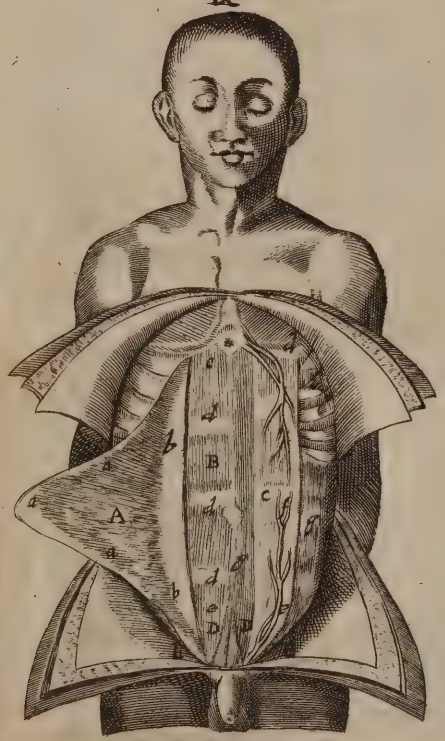

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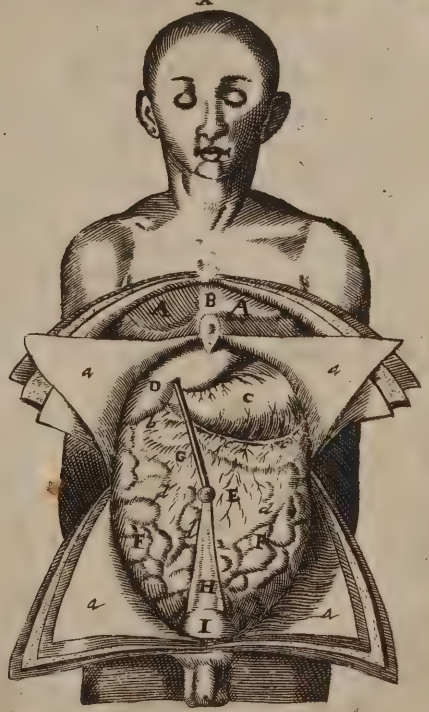


2.

CHAP. 3.

Of the Omentum, Stomach, and Guts.

HItherto of the external part of the *Abdomen*; we come now to the internal parts; of which, ſome perform the office of publick digeſtion, others the labor of begetting and conceiving the Child. Thoſe dedicated to publick digeſtion are, the Stomach, Sweetbread, Liver and Spleen; Subſervient to theſe are, the Guts, *Omentum*, Gall, Reins, and Bladder: The Veſſels which reſpect the Generation, are, the Spermatick Veſſels of both Sexes, the Privities of Men, the Womb of Women; of which we ſhall ſpeak ſeverally as they come to Anatomical view.

The firſt of the internal parts that comes to view is the *Omentum*, which the Ancients called *Epiploon*; it is a double Membrane filled with fat, which is joyned to the Stomach about the bottom, and ſpread over the Guts, that it may cheriſh thoſe bloodleſs parts by its gentle heat. Authors deduce its inferior wing immediately from the *Peritonæum*, its ſuperior from the common tunicle of the Stomach; it hath Veins from the *Vena porta*, and the ſuperiour wing hath the *Gaſtroepiploïca*, both right and left, which are common to the ſtomach alſo; the inferior wing hath the right *Epiploïca* and the *Poſtica*. Its Arteries are derived from the Cœliacal branch, and the Meſenteriack. Its Nerves are few and ſmal, and come from the plexure of the ſixt pair of the coſtal Nerves, and all this is that it might not be deſtitute of nouriſhment, life and ſence. It hath *Glandulæ* ſcattered here and there, ſometimes more, ſometimes fewer, which like Sponges take away the ſuperfluous moiſture thereof.

Its largeneſs is various according to the diverſity of Bodies; In ſome it is not ſtretched below the Navil, and in ſome it is; the fatter it is, the heavier it is, ſo that in very fat Women it cauſeth barrenneſs: In all it is double, and the Tunicles being taken away between the Stomach, Spleen, and the Gut Colon, it often give a receptacle to wind and ſeroſus humors. Its fatneſs takes away its natural coldneſs and drineſs, and yet in falling down it is very ſubject to putrifaction for this very reaſon, It is joyned to the round lobe of the Liver, to the Sweetbread, Spleen, and bottom of the Stomach, to the Gut Colon, which its office is to cheriſh.

The *Omentum* being taken away, the Stomach appears, being an Organical part of the inferior Ventricle, which converts the foot being taken and well chewed by the teeth into a white ſubſtance which the Ancients called *Chyle*; it conſiſts of a three-fold Membrane, which is ſtretched out when it receives in meat, and contracted again when it is digeſted; the outward Membrane is called common, and it is ſuppoſed to

receive it from the *Peritonæum*; the middle Membrane is more fleshy; that so it may retain the more heat; the inner is fuller of Nerves and is the very same that cloatheth the inside of the pallat, this is wrinkled and unequal for the better embracing the meat, and that it may not be suddenly vexed with the acrimony of juyces, it is defended with a mucilaginous crust, a delicate variety of *Fibræ*, is both in the middle and inner tunicle, stretched out, rightly, obliquely, and orbicularly, which gives solid strength and easie motion to it.

The stomach receives veins partly from the trunk of the *Vena porta*, partly from the branches thereof, both from the right, which is called the Mesenterick, and from the left, which is called Splenical: From the trunk of the *Vena porta* ariseth the vein which is called *Vena gastrica dextra*; others call it *Pylorica*, and it is divided about the lower Orifice of the stomach; from the Splenical branch ariseth the vein called *Gastrica major*, which compassing about the superiour region of the stomach, and the superior Orifice in form of a Crown, is called *Coronaria*, and by certain *Anastomosis* joyns it self to the *Pylorica*, then the lesser Gastrial veins, and the short vessel, or short vein, which is sometimes within, sometimes without the Spleen, is stretched out towards the bottom of the stomach; sometimes it is not single but manifold. Lastly, the vein called *Gastroepiploica sinistra*, which comes from the lower branch of the Splenical vein is distributed to the left side of the bottom of the stomach, as also to the *Omentum*: from the Mesenterick branch ariseth the vein called *Gastroepiploica dextra*, which also is distributed to the bottom of the stomach, partly before and behind, and partly to the *Omentum*, and it receives *Gastroepiploica sinistra* by Osculations. All these you may see cleerly delineated in the Table of the following Chapter, figure the sixt.

The Arteries of the Ventricle or stomach, arise from the Cœliacal branch of the great Artery, from its right, and especially its left branches, and keep company with the veins like man and wife together: The Nerves give the animal Spirit from the external branch of the sixt pair, both right and left, and are very copious about the upper Orifice; hence comes the sence of that place to be so ready and exquisite; and such a wonderful consent betwixt the stomach and the bowels, for that pair of Nerves, seing it is not bestowed upon the stomach alone, but also upon the rest of the parts of the *Abdomen* makes a great consent between them: we shall speak of it here briefly, but shall describe it and shew it fully in the Theater.

There ariseth a Nerve of the sixt pair within the skul from the beginning of the marrow of the back, a little below the fifth pair which seems to arise out of the concourse of very many smal Nervs having passed the Skull, it is knit to a Nerve of the seventh pair, and passeth to the tongue and the Muscles of the bone *Hyois*, and on both sides it is divided into an external and an internal branch.

The outward branch of the right side, after it hath administred branches to the Muscles in the Neck, then in its progress to the internal Muscles of the *Larinx*, then to the *Sphincter* of the Throat, between the Jugular vein and the Artery called *Carotides*; it slips under the *Clavicula* in the

the breaſt, certain branches which it ſent out being again united; they make that Nerve which is called *Recurrens*, or running back, becauſe running back about the ſubclavian Artery, neer the right ſide of the *Aſpera Arteria*, or Wind-pipe, then into the Wind-pipe; then is diſtributed in the Muſcles of the *Larinx*; making its Progreſſe from thence, and giving ſmal branches to the *Pleura* and *Pericardium*: It is ſtretched out not only to the external tunicle of the Lungs; but alſo in the Lungs themſelves, to the *Branchi* of the *Aſpera Arteria* by many branches: At laſt having obtained the name [*Stomachicall*] it is divided into two Branches, and penetrating both the *Gula* and *Diaphragma*; it embraceth the ſuperior Orifice of the ſtomach, with a Net like contexture of many ſmall Nerves, and it beſtows a ſmal Branch alſo upon the Liver.

The Internal Branch of the ſixt pair on the right ſide, ſtrengthens its *Fibræ*, with a long, red, and callous ſubſtance: In its Progreſſe by the fore-part of the Neck, whilſt it applieth to that plexure, which is made of the cervical pairs of Nerves, and taking ſmall Branches from them, growing thick again by its own callous Body, it is carried to the *Thorax* or Breaſt; in which deſcending under the *Pleura*, neer the roots of the Ribs: A ſmall Branch being taken from each inter coſtall Nerve (whence it obtained the name *Coſtalis*:) at laſt having paſſed the *Diaphragma*, and ſent certain ſmall Branches to the Original of the *Meſenterium*, with the other Internal Branch which is its companion, it produceth a Nervous plexure, variouſly guarded with callous Bodies, from which by the right Region of the *Meſenterium*, Branches paſſe to the Guts to the *Omentum*, Liver, Gall, and right Kidney: The remainder of it, which is free from this plexure, is partly ſpent upon the *os Sacrum*; partly upon the bottom of the Womb, and right ſide of the Bladder.

In like manner is the Nerve of the ſixt pair diſtributed by the left ſide of the breaſt and *Abdomen*; Save only the external branch of it bends back its *Recurrens*, under the trunk of the great Artery: Beſides it ſends a ſpecial Branch with very many Diviſions to the *Pericardium*, and the Heart its ſelf; then it paſſeth to the Nervous plexure of the *Meſcuterium*, partly by its ſelf, partly united to the right Stomachical, having firſt ſent a ſpeciall Branch to the Liver. The left internal Branch of the ſixt pair, even as the right makes up part of the plexure we ſpake of before, from which it is carried to the left Region of the *Meſenterium*, the Spleen, and left Kidney: That part which avoids this plexure is ſent to the *os Sacrum*, the bottom of the Womb, and the left part of the Bladder.

From this admirable pair of Nerves, we return now to the Stomach; the ſtructure of which in Man is ſingle, and the bigneſs mean: It is manifold in Beaſts, becauſe their meats are harder in digeſtion. It is diſtinguiſhed into the bottom or Cavity, and the two Orifices, of which that which is uppermoſt, and on the left ſide, our Anceſters propperly named the Stomach: It is garniſhed with many *Fibræ*, and Nerves circuled in an Orb: It is great and thick, and the ſeat of Natural appetite.

The inferior Orifice which is on the right ſide, the Ancients called *Pylorus*, or *Janitor*; for by this the meat digeſted paſſeth to the next

Guts as by a gate; the heat of the Bowels round about the Stomach, quallify its cold and dry Temperature: the Stomach is in form like the Bag of a pair of Bag-pipes; it is placed by the Wisdome of God, in the left *Hypochondrium* under the *Diaphragma*: The right part is committed to the Liver, the left to the Spleen, below, it is cherished by the *Omentum*, and underneath it lies upon the Sweet-bread, as it were upon a Pillow.

The superior Orifice passeth to the Throat or *Gula*, about the eleventh or twelfth *Vertebræ* of the Breast; the right or inferior Orifice passeth down to the Gut called *Duodenum*, and in this middle space of the *Hypochondria*, in which that Cartilage of the Breast called *Mucronata* is a little bowed inwards; make a Cavity of the Breast outwards; which the vulgar Latins call *Foveam cordis*, and we the pit of the Stomach.

In this place we often feel pains in the stomach, which we falsly impute to the upper Orifice thereof: when indeed they arise either from sharp or corrupt Food, or excrements, sticking about the narrow passages of the *Pylorus*; or sent up from the Gall thither. The various affections of the Sweet-bread being neer to the *Pylorus*, ad no small part to this trouble; as also the faults of the Cartilage called *Mucronata*, whether it turn its poynt inwards or outwards.

Now will we give this breife description of the *Gula*, which is also called *Osaphagus*; although it might more fitly be described with the *Aspera Arteria*, and the Lungues: Yet we will not separate those parts in word which Nature hath joyned together in deed. It is the channel by which both meat and drink descends to the Stomach: It is composed of just as many Membranes as the Stomach is.

About its beginning, it is moved by three pairs of Muscles, and the *Sphincter*, which causeth the deglution, or gulping in swallowing: The first pair is called *Cephalopharigigæus*; sent from the confines of the Head and Neck, and is stretched abroad in the Tunicle of the *Pharingæus*: The second pair is called *Sphenopharingæus*, which inclining downwards is extended in the sides of the *Oesophagus*; the third pair is called *Stylopharingæus*; it takes its beginning from the appendix called *Styliforme*, from whence descending with a fleshy and round Body, it ends in the sides of the *Gula*: Of these the first pair lifts up, the other dilate the *Oesophagus*: the *Sphincter* of the Throat, arising from both sides of the buckler like Cartilage, and opening transversly by the back part of the Throat, by stopping the *Gula*, drives the meat downwards.

It hath veins and Arteries in the upper part, from the jugular veins and Arteries, and from the internal Arteries called *Carotides*, Nerves from the external branches of the sixt pair; in the Breast it hath Veins from the Branch without a fellow, Arteries from the intercostals, Nerves as before; about the Stomach it hath the same, that it hath at its upper Orifice.

It hath many *Glandulæ* which administer moisture to its membranes, for the easier swallowing, of which the superiour are posited at the sides of the tongue and *Larynx*, the inferior which are many stick in the breast to the branches of the *Aspera Arteria*. The *Oesophagus* takes its beginning from

from the extremity of the Jaws, where it is joyned to the *Larinx*, descending streight down to the Breast, first towards the right side, then towards the left: It pierceth the *Diaphragma* about the eleventh *Vertebræ* of the back, and so is united to the superior Orifice of the Stomach.

As the Stomach is joyned to the *Gula*, so are the Guts to the *Pylorus*; they are ordained to take away the burden from the Stomach; to gather together, and cast out the excrements; they are covered with a Membranous substance like the Stomach; they have a common tunicle, largly ore-spread with the fat of the *Mesenterium*, for the better conversation of their heat; their propper Tunicle is double, intertexed with diverse strings, which give not only the greater strength; but also the readier motion; of the propper Tunicles, the middlemost is most fleshy, the inner more Nervous, slippery, and filled with wrinkles, both for their safegard, and the better to embrace what they have to embrace.

The Guts have very many Veins; from the right Mesenterical branch of the *Vena porta*, and also from the left: they have Arteries from the upper and lower Mesentericals, they have Nerves from the sixt pair derived from the Mesenterical plexure: to these come abundance of small passages, for the Distribution of *Chyle*; which in this age *Asselius* was the first that brought to publique view. Of which more when we come to the Sweet-bread.

The length of the Guts exceed the length of the Body of Man diverse times, and lye in many foldings, that so they may keep what they receive the longer: their Temperature is cold and dry, which is asswaged both by the vital Spirit, and the Fat: Their form is round, that so they may the better admit the Chile, and cast out the excrements; they are underpropped by the Bones, which are gently knit to the *Abdomen*; but more especially by the Membranous ties of the *Mesenterium*.

They are divided according to their Tunicles, into thin and thick: The first of the thin Guts *Herophilus* calls *Duodenum*; because, tis the breadth of twelve Fingers: this admits a pore from the Gall, by which sharp humors it is provoked to expell the Excrements; it is of a great largeness, that so it may unite the large Stomach to the smaller Guts.

Neither yet (if the name please your fancy) are you to begin your Mensuration at the *Pylorus*, but to determine it at twelve Fingers breadth, that so you may avoid two errors. First, That you give not part of the *Janitor* to this Gut. Secondly, That you be not led by that foolish conceit, that mens Bodies were formerly bigger than they are now; which the Sepulchres of those Kings and Priests in *Palestina*, those in the Pyramides in *Egypt*, and those Bodies which have been kept in *Arabia* in Mummy, many thousand years; not exceeding the Bodies in *Europe* in bigness, easily witnesseth.

The next of the thin Guts is called *Jejunum*; because of its emptiness, which the swift descending of the Chyle causeth: where this emptiness ends, the Gut called *Ilium* begins, and is the third of the thin Guts: It is so called from its manifold rings, or Circumvolections; it is longer than the rest by far, and hath very many Veins, and Arteries; but it is narrow, and thence it comes to passe that the internal Tunicles being

broken by a deadly ſtoppage, it cauſeth that diſeaſe called the *Iliack paſſion*: the office of the ſmall guts is to receive the *Chyle* and keep it that it may the better be diſtributed.

The firſt of the thick guts is called *Cæcum*, becauſe it hath no paſſage into another of the extream guts; this is very ſmall in ſuch as are grown up to age, and hangs like the wormlike proceſs to the beginning of the *Colon*, and the end of the *Ilium*, and yet it is not to be excluded from the number of the Guts, becauſe in children 'tis alwaies full of excrements, and performs the ſame office with the thick Guts

The *Colon* is the ſecond of the thick Guts, and is larger and wider than the reſt, it hath a ſmal ſhut which ſerves to ſtop the excrements and wind, that they may make a little delay in paſſing downwards: It riſeth about the right *Os Ilium*, and is joyned to the Kidney next to it, from thence bending under the Liver it is knit to the *Omentum*, the bottom of the ſtomach, the Spleen and left Kidney, from whence bending back it ends in the right Gut; it hath a proper bond of its own by which the order of its Cells are contained; it hath alſo a ſpecial Ligament by which it is knit both to the inferior and ſuperior parts.

The third of the thick Guts by reaſon of the manner of its extenſion, is called the right Gut, this by its proper and middle tunicle is far more fleſhy than the reſt, and full of right ſtrings; the lower part of it is moved by ſtrong Muſcles, to wit, *Sphincter*, by which it is drawn together, and two *Levators* by which it is lifted up; The *Sphincter* is joyned to the lower parts of the *Os Sacrum*, and is ſpread about the Fundament with fleſhy and tranſverſe ſtrings, to which a thin Muſcle is joyned both in body and office, in the extremity of the fundament, being about a fingers bredth, and as it were compact in the skin. The Muſcles called *Levators* ariſe from the Ligaments of the *Coxendix* and *Os Sacrum*, by a diſtinct portion they deſcend to the *Sphincter*; in men they joyn themſelves to the root of the Yard, in Women to the paſſage of the Womb.

The Hemorrhoidal Veins are ſcattered about the right Gut, the internal of which, moſt uſually ariſeth from the left Meſenterical of the *Vena porta*, but ſometimes from the right, ſometimes from the Splenical branch of the *Vena porta*, ſometimes from within the Spleen, ſometimes from without; the external Hemorrhoidal veins proceed from the Hypogaſtrick branch of the *Vena Cava*, and are diſtributed to the Muſcles that move the Fundament.

There are alſo Arteries which accompany the Veins, part of which come from the inferior Meſenterick branch, and part from the Hypogaſtrick Artery, to thoſe ſmal Nerves adjoyn themſelves which proceed from the extremity of the Marrow of the Back, and as it is the common office of the thick Guts to gather the excrements together, and provoke them to expulſion, ſo it is the property of the right Gut to retain them till occaſion ſerve to caſt them out.

Place here the Table of the third Chapter, which hath the Number 3. *at the corner of the braſs Plate.*

CHAP.

AN EXPLICATION OF THE TABLE OF THE THIRD CHAPTER.

The *Omentum* and *Meſenterium*, figure I. The *Gula* with its Muſcles, figure II. and III. The Stomach and Bowels under it, figure IV. The Tunicles of the Bowels, figure V. and VI. The Muſcles of the right Gut, figure VII. The Nerve of the ſixt pair, figure VIII.

FIG. I.

AAAA. The Meſenterium *with the Guts adjoyned.*
aaaa. The Glandulæ *of the* Meſenterium.
BBB. The *Veſſels of the* Meſenterium *diffuſed to the Guts.*
CC. *Part of the* Colon *ſtretched out.*
DD. *Part of the* Omentum *drawn abroad upwards.*

FIG. II.

AA. The *firſt pair of the Muſcles of the* Gula, *called* Cephalopharyngæus.
BB. The *ſecond pair of the Muſcles of the* Gula, *or* Sphenopharingæus.
CC. The *third pair*, Stylopharingæus.
DD. The Sphincter *of the Throat.*
EEE. *A backward view of the* Gula.
F The *left external Nerve of the ſixt pair.*
G. The *right external Nerve of the ſixt pair.*
H. The *ſuperior Orifice of the Stomach.*
III. The *bottom of the Stomach.*
K. The *inferior Orifice of the Stomach with a portion of the* Duodenum *annexed to it.*

FIG. III.

AA. The *Muſcles* Cæphalopharyngæus *conſpicuous on the fore part.*
BB. The *Muſcles* Sphenopharyngæus.
CC. The *Muſcles* Stylopharingæus.
DD. The Sphincter *of the throat dilated.*
E. The *internal face of the* Gula.
F. The *deſcending part of the* Gula.

FIG. IV.

A. The *ſuperior Orifice of the Stomach knit together within a threed.*
B. The *inferior Orifice*, or Pylorus.
CC. The *common tunicle of the Stomach ſeparated.*
D. The *middle tunicle of the Stomach.*
E. The *inner tunicle of the Stomach.*
F. *A portion of the* Duodenum.
GG. The *gut called* Jejunum.
HHH. The *gut* Ileum *as it lies in its foldings.*
I. The *Gut* Cæcum.
KKK. The *Gut* Colon.
L. The *ſhut, being opened in the beginning of the* Colon.
M. The *beginning of the right Gut, knit with a threed.*

FIG. V.

PP. The *common tunicle of the guts ſeparated.*
Q. The *middle tunicle of the Guts, which is the firſt proper one.*

FIG. VI.

R. The *rugged tunicle of the Guts which is the ſecond proper.*

FIG. VII.

M. The *right Gut cut off.*
NN. The *two muſcles called* Levatores.
O. The Sphincter *of the Fundament.*

FIG. VIII.

♆. The *Nerve of the ſixt pair on the right ſide, in which*
AA The *external and greater Branch.*
a The *branch which is carried to the Neck.*
b *A branch of the ſeventh pair, joyned to this ſixt pair which is carried to the Neck.*
c *A Nerve of the ſeventh pair joyned to the ſixt under the ſkull.*
d *A branch of the ſeventh paſſing to the muſcle of the* Os Hyois.
e *A branch from the ſeventh to the tongue.*
ff *A Nerve from the external branch of the ſixt pair, which is carried to the internal muſcles of the* Larynx.
gg The *right Nerve called* Recurrens.
hh *Many Nerves diſtributed to the Lungues and windpipe.*
iii The *branches of the right Stomachical, ſtretched out.*
BBB The *internal, or coſtal branch, laid open with its bunches.*
▽ The *Nervous plexure of the* Meſenterium *guarded with certain callous Bodies.*
ll The *branch which is carried to the* Omentum, Duodenum, *and Liver.*
mm The *branch which is carried to the right Kidney.*
nnnn The *branches diſtributed in the* Meſenterium *and Guts.*
o The *branch which goes to the* Os Sacrum.
pp The *extremity of the internal right branch, which is diſtributed to the Womb and Bladder.*
qr The *branches from the internal right ſide, which make the plexure on that ſide.*
♄ The *Nerve of the ſixt pair on the left ſide; in which, the ſignification of the Letters is the ſame, ſave only*
G *Is the Nerve from the left* Recurrens, *which is diſtributed to the* Pericardium, *and Heart it ſelf.*
** The *Nerve which from the external left ſtomachical is carried to the Liver.*
ll The *Nerve which is carried to the Spleen and Gut* Colon.
mm The *Nerve of the left Kidney. The remainder are the ſame with the former.*


I
II
III
IV
V
VI
VII
VIII
3

CHAP. 4.

Of the Meſenterium, Sweet-bread, Liver and Spleen.

THE moſt wiſe Creator of Man, hath taken care by the intervening of the *Meſenterium*, that the manifold foldings of the Guts might not come into a confuſion, and ſo mans health be indangered thereby; It is a double Membrane, furniſhed with *Glandulæ* and fat, joyned to the *Peritonæum*, fitted to cheriſh the Bowels as well as to keep them in Office and Order; a famous number of Veins are diſperſed in it from the right Vein of the *Vena porta*, joyning themſelves together by many Oſculations, even before thoſe ſmall branches go to the Bowels. The Arteries are not inferior to theſe, which proceed from the Meſenterical ſuperior branch of the great Artery, and alſo from the inferior: It hath many Nerves from the plexure of the internal of the ſixt pair, and the Marrow of the Loyns.

To theſe belong thoſe paſſages which carry the Chyle, which the firſt obſerver of them, called *Venæ Lacteæ* becauſe of their white colour; but this as it may be ſeen in the diſſection of live creatures, ſo the creatures being dead, and the diſtribution of Chyle ceaſing, the whiteneſs cannot be diſcerned.

And yet it often happens, that by reaſon of the intemperancy of men, abundance of humors flowing through ſo many Veſſels, the pores which carry the Chyle are obſtructed or (in plain Engliſh) ſtopped, and the Juyce being putrified, it cauſeth feavers, the cauſe lying in the *Meſenterium*.

The largeneſs of the *Meſenterium* is great, being encreaſed by fat which corrects the cold and dry temperature of the Membranes by heat and moiſture; it ſticks ſtrongly to the uppermoſt and third *Vertebræ* of the Lyons, and binds the foldings of the Guts, every where firmly to its ſelf.

The Sweet-bread [*Pancreas*] is a Glandulous part of the *Abdomen*, very profitable for attenuating and purging the Chyle, and preparing it for the Liver and Spleen before it be turned into blood, for as Nature deduceth the blood it ſelf, which is either for nouriſhment of the fruit in the womb, or to make ſeed for the Generation of it, by diverſe degrees or ſteps, even ſo the Juyce which it turns into blood, it alters it in the mouth, concocts it in the Stomach, eaſeth it of excrements by the Bowels, and by the ſweetneſs of the Sweet-bread, frees from ſharp and ſalt humors, and therefore the Sweet-bread is alwaies full of *Chyle*, as you may find if you diſſect a creature alive, and cut it with a knife.

It receives the *Chyle*, and having received it, ſends it to the Liver; not by any veins or arteries deſcending from the *Vena porta*, but by ſpecial paſſages, which by reaſon of their colour, *Aſellius* named *Venæ Lacteæ*, as I told you before: they are long and round Veſſels with a very thin Membrane, very ſmall, aſcending upwards from the Sweet-bread, to the Liver; about the place where the trunk of the *Vena porta* deſcends, they paſs downwards to the Guts with very ſmall branches; they have very ſmall ſhutters which hinders the regreſs of the juyce they draw to the Guts; the knitting of the Sweet-bread to the Spleen ſeems rather to perſwade a man that they paſs thither than any paſſage yet found out; and yet it is certain they do paſs thither, becauſe they convey a watry portion of *Chyle* not yet coloured to the Spleen.

The Original of the *Venæ Lacteæ* is deduced from no place ſo fitly as from the Sweet-bread; for as Nature produceth all veins and arteries from the trunk, from which the branches are diſtributed throughout the Body, ſo the foundation of the *Venæ Lacteæ* is at the Sweet-bread, and the branches paſs to the Liver and Guts; and yet the Creator of all things would not bring them into one common Trunk, by reaſon of the latitude of the Sweet-bread; as the Nerves which are the Organs of the ſences though they ariſe from one ſpring, yet is their intervals in their originals, the Splenical branch of the *Vena porta*, and the left Cœliacal Artery, as alſo ſmall Nerves from the Gut *Duodenum*, paſs through the Sweet-bread, and yet it hath a proper Vein of its own, from the *Vena porta*, and Arteries from the left Cœliacal, and a thin skin from the *Meſenterium*, which incompaſſeth it round.

Alſo there is a moſt obſervable and ſingular channel in the Sweet-bread, lately found out by our *Verſungus*, which to a curious eye carries the ſtructure and ſhew of a vein: It ariſeth from the Gut called *Duodenum*, ſometimes in the extremity of the biliar pore, having a common Orifice with an outward ſhut, ſometimes neer the biliar pore, from a diſtinct place; it is ſtretched tranſverſly in the Sweet-bread with ſhort, yet very many branches; it is wide at the beginning, and conſumes by degrees before it come at the extremity of the Sweet-bread; ſometimes it is double in man, but unequal in length, and ariſeth neer the biliar pore at about a fingers breadth diſtance.

The uſe of this channel is no waies hard to be found out, for ſeeing it brings a certain ſharp juyce not unlike to the Gall, it ſeparates the juyce of its own Nature from the *Chyle*, and carries it away to the Gut *Duodenum*, and therefore this being ſtopped, the Sweet-bread ſwels by reaſon of the excrements retained; and ſo, many veſſels being by this means compreſſed, the Liver and Spleen receive no ſmall damage.

The Sweet-bread in fat men is bigger, and in ſuch as die not through default of Nouriſhment, it is of a cleer white colour, and therefore of old it was called *Lactium*: It is ſtretched out tranſverſly under the Stomach towards the Spleen, being more diducted towards the Liver; it hath a wonderful nexure with the Liver, by proper veſſels and paſſages compaſſed about with a Membrane: It ſticks cloſe alſo to the *Duodenum*, as though it drew a part of its Chyle from it; its copulation with the

Spleen

Spleen is not so strong, and besides its former offices, it cherisheth the Stomach.

The Liver succeeds this, being a famous part in the lower ventricle, being the shop, or work-house of Blood and Natural Spirit: Its substance is fleshy, like congealed blood, whence *Erasistratus* gave it the name *Parenchyma*; in the *Embrion* like other parts produced of seed, it is white, only the small Veins in it look red, then it looks yellowish by degrees, till at last it get the perfect colour of blood; and yet there are some living Creatures that although the blood in the Veins be red, yet the Liver is white, yellow, or green, it is covered with a thin single Skin, sticking round about close to it.

It hath Veins of two sorts, the superior, or *Vena Cava*, which by its great trunk carries blood from the Liver, and distributes it throughout the Body: The inferior, or *Vena porta*, the branches of which are more in number, from which the umbilicate Vein ariseth to the Child in the womb, and without the Liver, the branches the Splenical and Mesenterical Veins pass, which distribute blood to the Spleen *Omentum*, Stomach, and Guts; a freequent conjunction is made between these, that so the blood may be dispensed the more perfectly, the more easily. Some few Arteries accompany the Veins about the Liver, from the right Cœliacal branch of the great Artery, and two small Nerves from the right internal of the sixt pair, and the external left Stomachical.

The magnitude of the Liver in Man is great, and its figure almost round, it is divided into two parts, bending and hollow; the first being bowed, fits its self to the levity of the *Diaphragma*, the other is inferior, and more unequal, for it sticks out in a *Lobus*, and is hollow with a double *Sinus*, the one of which holds the Gall, the other embraceth part of the Stomach: Lastly, by a notable cleft it sends out the umbilicar Vein, which in Men grown up, is hardned to a Ligament. The temperature of the Liver is hot and moist, that so it may the better concoct the blood.

Above, it is joyned to the *Diaphragma*, and to the Cartilage of the Breast called *Mucronata*, by a strong Membranous Ligament: backwards it is joyned by the *Peritonæum* to the *Vertebræ* of the loyns; below, it sticks to the *Abdomen* by the umblicar Ligament; it is placed under the *Diaphragma* and the Cartilages of the ribs, on the right side of the *Abdomen*, and embraceth the Stomach, and cherisheth it by its kind heat.

The Gall is joyned to the Liver, and is the receptacle of the cholerick juyce of the Blood: It is composed of two Membranes, whereof the outer is common to the *Peritonæum*; the inner which is propper to the Gall, is thicker and furnished with *Fibræ* of all sorts, for its better motion, and greater strength: Also it is defended, with a certain crust against the acrimony of the substance it contains. It hath Veins from the *Vena porta*, and small Arteries from the right Gœliacal. It hath a Nerve from the plexure of the Costalls: it hath peculiar passages into the Liver, between the roots of the *Vena Cava* and *Vena porta*, whereby it draws its Choller.

It is divided into the bottom which is wider, and the Neck which is narrower: a narrow channel goes from the Neck of it, with ſhutters to keep the Choller from running back, which ends in the biliar pore; the narrowneſs of which is the cauſe that often times the thick excrements of the Gall breads ſtones in it, though not very hard ones, ſometimes round, ſometimes angular; and ſometimes like a Mulberry both in colour and form. The Gall is in the right *Sinus* of the Liver, and firmly joyned to it, both by its upper and middle part.

The Biliar pore is ſomething larger than the channel of the Gall, and carries Choller from the Liver to the Gut *Duodenum*: It is carried into the *Duodenum* by an Oblique flexure between the Membranes; uſually 'tis ſingle, but ſometimes double towards the end: It ſeldom reacheth to the *Pylorus*, and as Nature expels choller by the channel of the Gall at ſet times: by this pore it is adminiſtred by degrees, and continually, both when the *Chyle* is diſtributed, and before; as is cleer in the diſſection of Creatures alive.

The Ancients held Choller to be the poyſon of the Body, the worſt excrement of Blood, and that not a few living Creatures wanted it; becauſe they could find no Gall anexed to the Liver: but all Creatures that have Blood, have this Biliar pore, and if the Body be diſpoſed according to the law of Nature: this hot and ſharp humor both defends the *Chyle* from putrifaction, and cauſeth the excrements eaſily to be expulſed, and ſtrengthens the Bowels; by which means health is firmer, and life the longar.

Over againſt the Liver, is the Spleen, being an Organical part of the inferior Ventricle, which receive the watry, and earthy part of the *Chyle* to be turned into Blood, its ſubſtance is fleſhy; yet looſer than that of the Liver, being like a Sponge to drink up copious humors, and therefore when it is obſtructed, it ſwells mightily; it hath one ſingle skin which Authors aſign to the *Peritonæum*, it hath Veins from the Splenical of the *Vena porta*, which are as ſmall as hairs: Its Arteries are more in number, and more famous (by reaſon of which, it hath much vital heat) and thoſe from the left Cœliacal branch: It hath Nerves from the left branch of the coſtals of the ſixt pair, and from the Nervous plexure of the *Meſenterium*, diſperſed by the exterior parts.

The magnitude of the Spleen is bigger in melancholly Men than in others; its temperature, by reaſon of the abundance of Arterious blood it receives, is hot and dry: It is of a blackiſh purple colour in youth, of a leaden colour in age; it is in form, hollowiſh in the internal face, gibbous on the external, and not much unlike to a Neats-tongue; although this be not alwaies, for ſometimes it is greater, firmer, with ſome diſtinct lobes of the colour of thick Blood, ſo that it ſeems to be like to the Liver not only in form, but alſo in office: Its place is in the left *Hypochondrium*, a little lower than the Liver, it is knit to the *Diaphragma*, and to the Cartilaginous ribs, and to the left Kidney, by its bowing part; but by its hollow part to the *Omentum*, Stomach and ſweet-bread, by other veſſells, and its own Membranes.

All the learned agree, that the office of the Spleen, is to draw the watry and

AN UNFOLDING OF THE TABLE OF THE FOURTH CHAPTER.

The fourth Table laies down the Scituation of the Sweet-bread, Liver, and Spleen, and the Delineation of the *Vena Porta*.

FIG. I.

A The hollow part of the Liver.
B The round convex, or bowing part of the Liver.
c The umbilicar Vein drawn upwards.
C The Gall in its Scituation.
D The Spleen in its natural place.
EE The Sweet-bread in its proper place.
FF The Vena Porta descending by the Sweet-bread under the Liver.
G The superior Mesenterical Artery.
aaaa The branches of the Vena Porta, extended by the Mesenterium.
bbbb The branches of the artery distributed by the Mesenterium.
HH The Mesenterium it self dismantled of its superior Membrane.
II The Splenical Vessels laid open, the Pancreas being cut.

FIG. II.

AA The Body of the Sweet-bread deciphored in its Natural form.

FIG. III.

The back part of the Sweet-bread, together with the Spleen turned downwards.

AA The substance of the Sweet-bread, its Membrane being taken off.
BBB The channel of the Sweet-bread newly found out.
C The biliar pore joyned to the channel.
DDD A portion of the Guts Duodenum and Jejunum, cut off.
E The common Orifice, by which the biliar pore and channel of the Sweet-bread, open themselves into the Duodenum.
FFF The internal face of the Spleen.
GGG The veins and arteries distributed in the Spleen.

FIG. IV.

AA The convex or bowing part of the Liver.
B The skin of the Liver separated from it.
CC The Ligament of the Liver called Septale.
DD The large branches of the Vena Cava within the Liver.

FIG. V.

AA The hollow part of the Liver turned upwards.
B The Lobe of the Liver by which it joyns it self to the Omentum.
C The cleft of the Liver, out of which the umbilicar vein descends.
E The umbilicar vein turned upwards.
F The Gall placed under the Liver.
G The channel of the Gall.
HH The biliar pore, with the channel stretched outwards, together with a part of the Duodenum, noted by *M*.
I The trunk of the Vena Porta descending from the Liver.
K The right Cæliacal artery.
L A Nerve arising from the plexure of the costals.

FIG. VI.

The *Vena Porta* whol, distinguished into branches, as it is publiquely shewed.

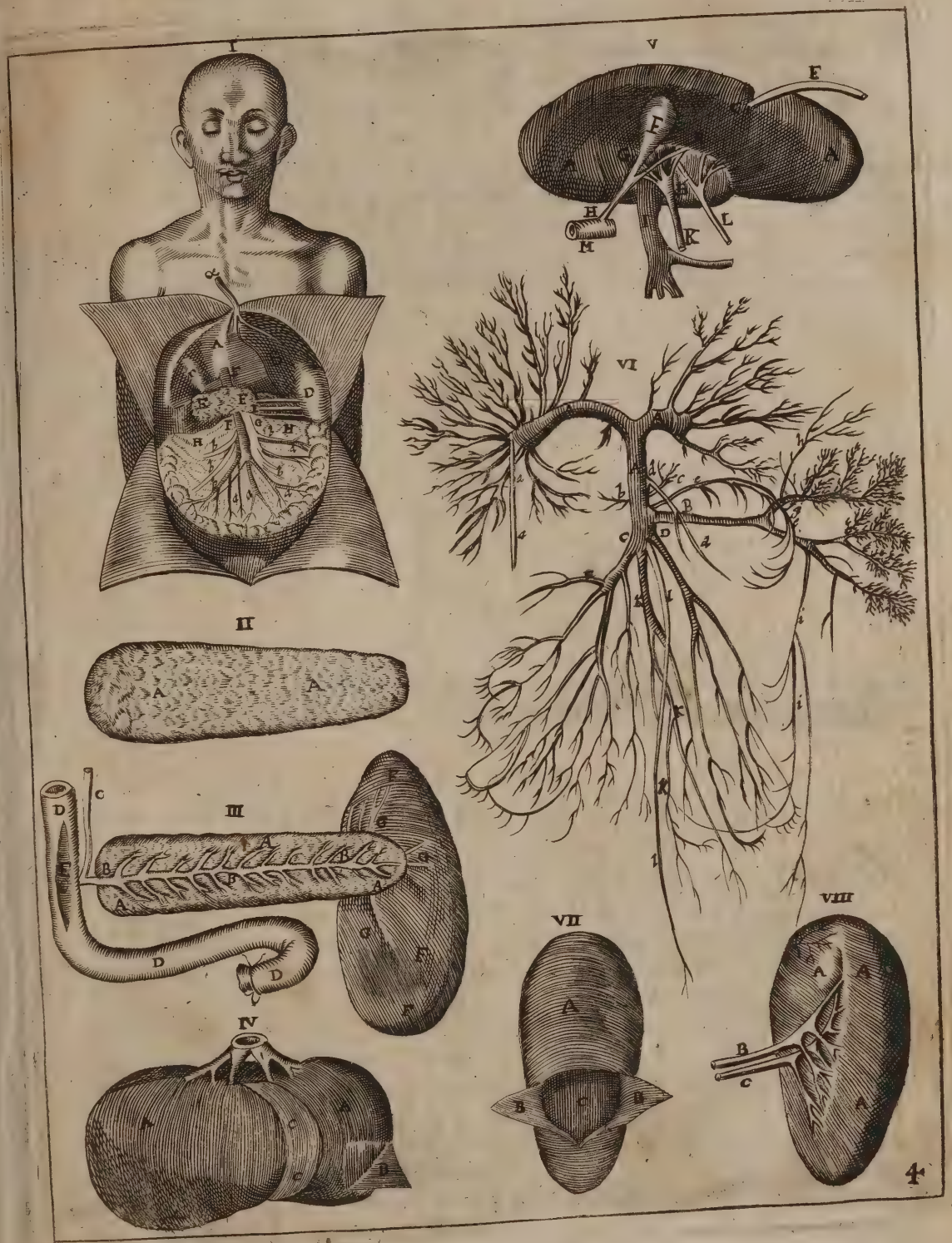
AAA The trunk of the Vena Porta; *A* the inferior portion, descending from the Liver. *AA* the deduction of it to the right and left with an infinite number of smal branches.
B The Splenical branch, divided first into great, afterwards into very many smal branches, and distributed like strings about the Spleen.
C The right Mesenterical branch.
D The left Mesenterical branch.
aa The umbilicar vein,
b The vein of the Gall.
c The vein of the Sweet-bread.
dd The vein called Gastrica dextra.
eee The greater Gastrica sinistra.
fg The lesser veins called Gastricæ sinistræ.
h The vein called Vas breve.
ii The vein called Gastroepiploica sinistra.
KK The vein called Gastroepiploica dextra.
ll The Hemorrhoidal veins produced here from the right Mesenterical branch of the Vena Porta.
m The vein of the Duodenum.

FIG. VII.

A The convex part of the Spleen laid open.
BB The Membrane of the Spleen separated.
CC The black substance of the Spleen.

FIG. VIII.

AAA The hollow part of the Spleen which receives the Vessels.
B The Splenical vein with its three branches.
C The Splenical artery divided in like manner before it enter the Spleen.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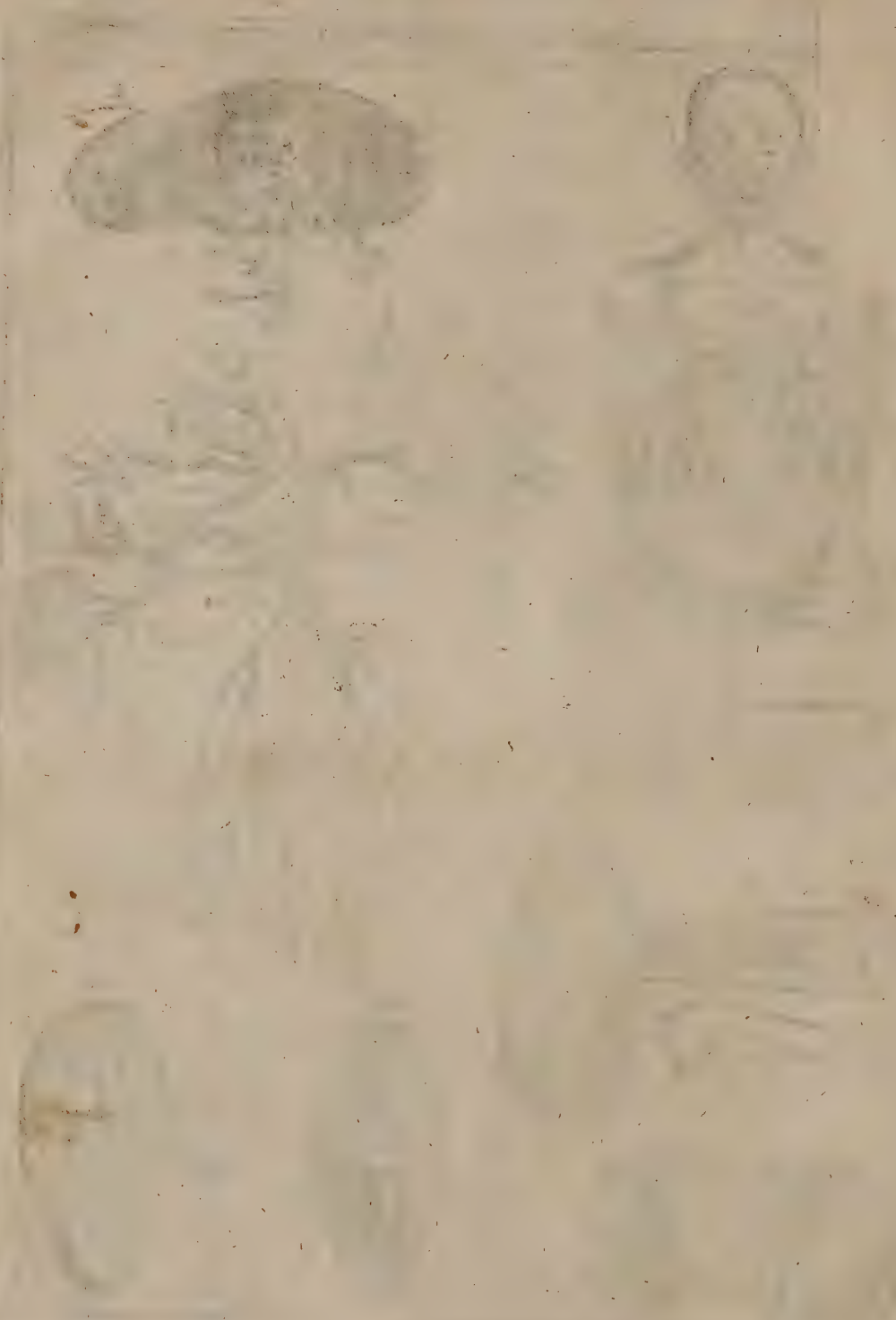


and earthy part of the *Chyle*: the Blood being made of the purer part, but nature hath clouded the paſſages by which this is carried to the Spleen, for no obſervation as yet hath diſcovered any paſſages of the *Venæ Lacteæ* into it, and that it is not carried by the Splenical Vein, the diſſection of Creatures alive witneſſeth; as for the Arteries, their office is to carry vital Spirit to it.

And yet it is agreeable to reaſon that it ſhould draw it from the Sweetbread it ſelf, though by reaſon of the ſmalneſs of the paſſages it is not manifeſt, and it may poſſibly draw the ſaid juyce from the Stomach, which lies neer it, and for this the ſubſtance of the Spleen, its abundance of vital Spirit, its ſicitaſion, and the diſeaſes it is ſo often moleſted with, ſeems to plead.

Place here the Table of the fourth Chapter, which hath the Number 4. at the corner of the braſs Plate.

CHAP. 5.

Of the Kidneys, Ureters, *and* Bladder.

THe moſt wiſe Creator of the Body of Man hath ordained the Reins, or Kidneyes, to receive that thin moiſture which is redundant in the making of Blood; they conſiſt of a thick fleſhy ſubſtance, leaſt the continual, and copious flowing of moiſture to them ſhould weaken them: If you would ſearch into them, you muſt of neceſſity remove the Membranes wherewith they are covered, and they indeed are two; the one external, common to the reſt of the bowels by the *Peritonæum*, the other internal; the external is endewed with much Fat, which gave names to the Veins and Arteries Paſſing to it.

Beſides them, on both ſides is a glandulous Body, which is called *Glandula renalis*, *Ren. Succenturiatis*, and the *Capſula* of melancholly: It is compaſſed about with a thin skin, furniſhed with veſſels of all ſorts: the right *Glandula* often receives a Vein from the trunk it ſelf of the *Vena Cava*, which is ſhort, yet wide, going into its *Sinus* with a wide Orifice, and ſometimes it takes it from the next emulgent Vein, as the left doth; its Arteries proceed from the emulgents, and Nerves from thoſe which are communicated to the Kidaeyes, their magnitude is not alwaies a-

like, they are usually as big as that drug we call *nux Vomica*; if the Man be any thing ancient, their form is like the Kidneyes, long, and somewhat depressed; sometimes the upper part of them is angular: they have a Cavity within filled with black and melancholly matter, their colour is sometimes reddish, and sometimes like Fat.

They are placed under the *Diaphragma*, above the fatty Membrane, so as the right is joyned to the *Vena Cava*, the left is a little under the stomach; what their use is, is not yet sufficiently found out; 'tis supposed that they help the passage of the serosus moisture, and contract a part of the melancholly, which like a Runnet helps to seperate the urine from the Blood, also to underprop and cherish the parts next it; although sometimes there are more and lesser *Glandula* furnished with Veins and Arteries, which Nature disposeth about the Kidneyes.

But the internal and propper Membrane of the Kidneyes, binds the Kidneyes themselves straight about: To which Kidney come large vessels, to wit, a Vein, and an Artery, both of them known by the name *Emulgent:* The Emulgent Vein is something unequal in scituation, proceeding from the trunk of the *Vena Cava*, being double at first, and then dispersed in diverse divided Branches: also the Emulgent Artery is almost as big as the Vein, and ariseth from the trunk of the great Artery, and brancheth it self into the Reins as the Veins do: the number of the Emulgent vessels is often different, and their progresse to the Kidneyes unequal, Nature providently regarding its own scope; to these some smal Nerves are added, from the plexure of the internal branch of the sixt pair, to which the left Stomachical branch comes.

The Kidneyes have fleshy knobs, called *Papillares*, because they are like teats, they are about the bigness of a Bean, and about ten in number, disposed with certain intervals, that so by their smal pores the urine may pass cleer to the ureters.

Also the Creator of Man hath formed two Kidneyes, by reason of the multitude of humors they are to seperare, and that if either of them be at fault, the other might be subservient to him; they are in form like to a french Bean (which from them, were called Kidney Beans) outwardly bowing, inwardly unequally hollow: It is monstrous when both of them stick together; or when they are so bowed that both ends touch, or when either of them is double; yet their surface is often unequal by reason of *Glandulæ* that stick to them, in the conception, and remains even in age. The copiousness of water that continually flows to the Reins, mitigates their hot and dry quallity: the right Kidney lies under the Liver, the left under the Spleen, neer the Muscles of the loyns called *Psoas:* The right Kidney lies lowest, by reason of the bigness of the Liver, both of them are joyned to the *Diaphragma*, and loyns by the outward Membrane.

The Ureters receive the urine, being separated by the Reins, and carry it to the Blader, they are round channels composed of a double Membrane, the exterior of which they have from the *Peritonæum* for their strength sake; the interior is propper to themselves, strong and Nervous, endewed with many right and oblique strings, they have small

ſmall Veins and Arteries from the next deſcending veſſels, and ſmall Nerves from the Plexure of the ſixt pair, and from the loyns; they are uſually in number two, ſometimes more, the third deſcending from the left Kidney neer the ſecond.

They take their beginning from that looſe and membranous *Sinus* which Authors call *Infundibulum renum*, from which they paſs within the ſmall pores of the Reins, and their extremities being opened, they take in thoſe fleſhy knobs called *Papillares*, which we ſpake of before, to which they are uſually equal in number; then contracting themſelves, they deſcend and paſs above the Muſcles *Pſoas*, and paſs into the Bladder toward the lower part thereof between the Membranes.

The Bladder is an organical part of the inferior Ventricle, which keeps the Urine it receives from the Kidneys, and expels it when the weight or acrimony of it makes it troubleſom; It conſiſts of a three-fold Membrane, the external of which, the *Peritonæum* beſtows, the other two are proper to its ſelf, of which the middlemoſt is thickeſt and full of fleſhy ſtrings, and is of great concernment for the expulſion of the Urine; the innermoſt is thin and quick of ſence, and defended from the ſharpneſs of the Urine by a mucous cruſt: It hath veins and arteries from the Hypogaſtricks; Nerves from the lower internal branches of the ſixt pair which touch not the plexure of the *Meſenterium*, and alſo from the *Os Sacruum*, not only age, but alſo its violent ſtretching alters its magnitude.

It is divided into the bottom and the neck; the bottom is the ſuperiour and wider part of the Bladder, from which the *Urachos* paſſeth to the Navil, which is wider towards the bottom, but grows ſlender by degrees towards the Navil; this when man grows to any age, together with the Umbiliar Arteries, makes that ſtrong Ligament of the bladder, by help of which the bottom of it is detained, which elſe would be depreſſed by the Bowels lying upon it, (which ſee more at large in the Tenth Figure of the Second Chapter) and yet ſometimes it happens even in ancient people, that the *Urachos* being looſned by ſome violent means, gives way to the Urine by the Navill.

The neck of the Bladder is the inferior part, more narrow, more fleſhy: The ſtrings of this being caſt in a circle, makes the *Sphincter* which ſhuts the paſſage that the Urine may not flow from us whether we will or not: The Bladder hath three paſſages, of which, two are obſcure, by which the Urine paſſeth into it by the Ureters; one greater, by which it paſſeth out: It is in form like a Pear, and poſſeſſeth the bottom of the inferior Ventricle; the bottom of it is faſtened by the *Urachos*, the Neck in Men to the right Gut and the *Glandulæ proſtatæ*; in Women to the Neck of the Womb and the *Os Pubis*.

Between the Bladder and the Reins, in the publick order of Diſſections, there is worth the obſervation, the deſcending Trunks of the *Vena Cava* and the great Artery, although Nature ſeldom keep the ſame order in the number, magnitude, and ſcituation of the branches. The

Vena Cava after it hath ſent out the Emulgent under the *Diaphragma*, and the Spermatical veins paſſing downwards, it ſends out three or four Lumbals and diſtributes them to the *Vertebræ* of the Loyns, and the marrow included in them, the ſuperior of which paſſing upwards are joyned by *Anaſtomoſis*, to the deſcending branches of the internal Jugular about the *Os Sacrum*; the Trunk of the *Vena Cava* being placed under the great Artery, is divided into two great branches which are called *Iliacks*, to wit, the internal and external, from which the ſuperior *Vena Muſcula*, and *Vena Sacra* proceed. From the internal Iliack branch, which is the leaſt, ariſeth the *Muſcula Glutea*, and the famous Hypogaſtrick vein, which gives branches to the longitude of the neck of the Womb, to the Muſcles of the bladder and right Gut, and to the *Os Sacrum*: from the external Iliack branch, which is the greateſt, after the internal Iliack the Epigaſtrick vein, which is double in Women and proceeds to the neck of the Womb and the Privities, the remainder of it after it hath paſſed the *Abdomen*, makes the *Crural branch*, which we ſhall ſpeak to hereafter.

The progreſs of the great Artery is not much unlike to this, for after it hath brought forth the former Meſenterick Artery; then the Cœliacal; afterward, the Emulgent, Spermatick, and inferior Meſenterick, the Lumbals, and that which is called *Sacra*: It is divided about the *Os Sacrum* into Iliack Branches, of which the interior produceth the Arteries, *Muſcula* and *Hypogaſtrica* which keep the ſame pace with the Veins; the exterior brings forth the Epigaſtrick and the *Pudenda*, that which is remaining deſcends to the Legs, andmakes the Crural Arteries.

Of theſe Veins and Arteries, ſee more in the laſt Chapter of the Book.

Place here the Table of the fifth Chapter, which hath the Number 5. at the corner of the braſs Plate.

CHAP.

AN EXPLANATION OF THE TABLE OF THE FIFT CHAPTER.

The Table lies upon the Brain with the Cleaving, the Ramifyers Veſſels and Channel. All the ſize and progreſs of the Stomach Veſſels.

AN EXPLANATION OF THE TABLE OF THE FIFT CHAPTER.

The present Table laies open the Reins with their *Glandulæ*, the Emulgent Vessels, Bladder and *Ureters*. Also the rise and progress of the Spermatick Vessels.

FIG. I.

AA The Glandulæ *of the Reins, or the* Capsula *of Melancholly.*
B *The right Kidney uncovered of the Membrane.*
C *The left Kidney.*
D *The descending trunk of the* Vena Cava.
E *The descending trunk of the great artery.*
FF *The right* Ureter.
GG *The left* Ureter.
HH *The right Vessels preparing the Seed.*
II *The left Vessels preparing the Seed.*
K *Part of the Bladder, besides which, the Vessels carrying the Seed are turned in the* Abdomen.
L *Part of the right Gut cut off.*

FIG. II.

AA *The common Membrane of the Reins which is bespread with fat.*
BB The Glandulæ *of the Kidneys.*
C *The right Kidney.*
D *The left Kidney.*
E *The proper skin of the Kidneys partly separated.*
F *The trunk of the* Vena Cava *descending.*
G *The trunk of the great artery descending.*
H *The left Emulgent Vein.*
II *The right Emulgent Vein.*
aa *The right Emulgent arteries.*
bb *The left Emulgent arteries.*
c *The left Spermatick artery.*
d *The left Spermatick Vein.*
e *The right Spermatick Vein.*
f *The right Spermatick artery.*
g *The Fatty Vein arising from the Emulgent.*
h *The fatty artery.*
KKKK *The ureters on both sides.*
LLLL *The Vessels preparing the Seed.*
MM *The* Scrotum *with the testicles in it.*
NN *The Vessels carrying the Seed.*
O *The Bladder stripped of his external tunicle.*

FIG. III.

A The Capsula, *or right* Glandula Renalis.
BB *A Vein from the trunk of the* Vena Cava *coming into it.*

FIG. IV.

A The Capsula *dissected.*
BB *The hollowness of the* Capsula *somewhat laid open.*

FIG. V.

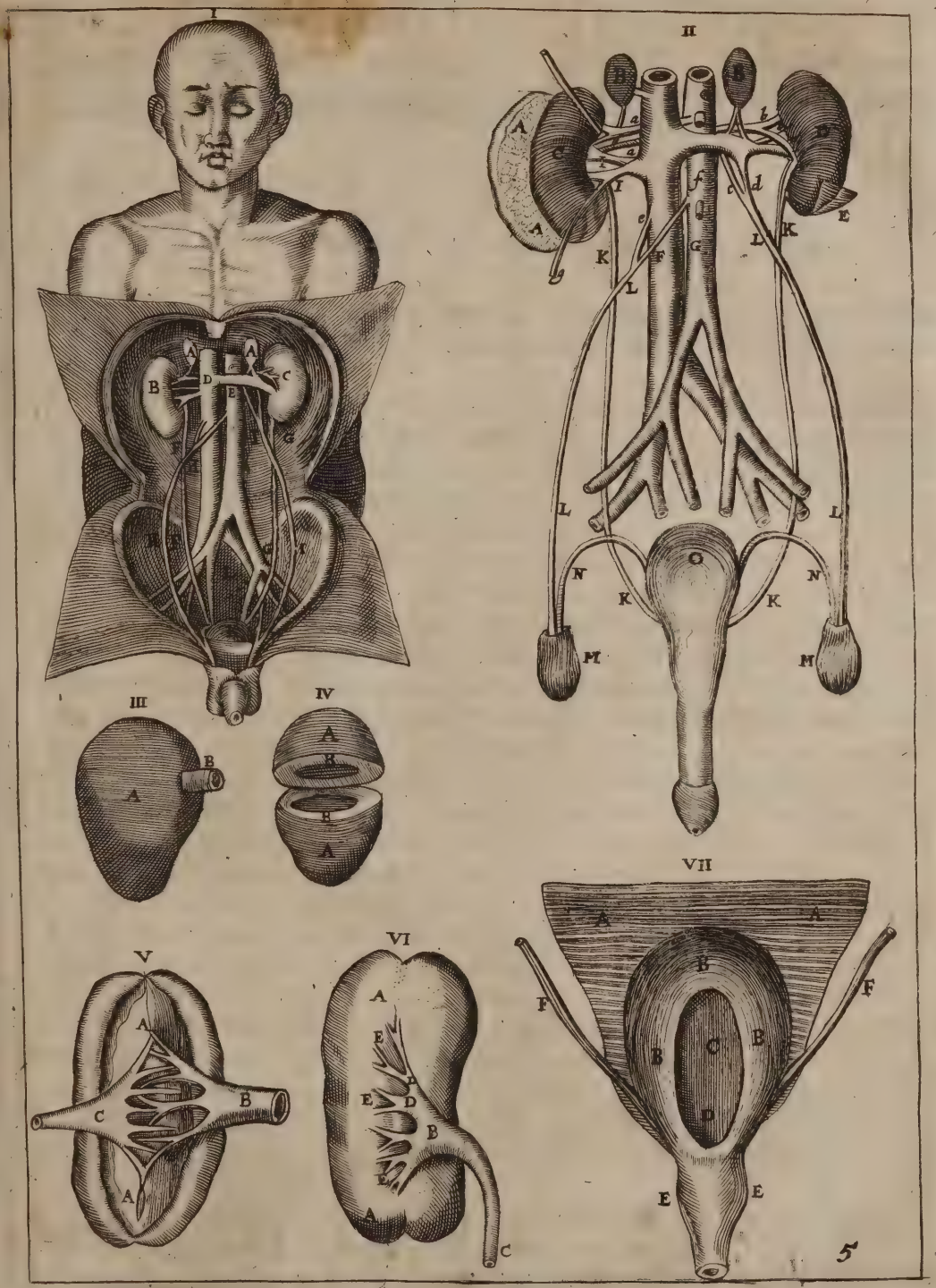
AA *The internal face of the dissected Kidney.*
BB *The Emulgent Vein with his branches distributed in the Kidney.*
C *The Emulgent artery in like manner distributed.*

FIG. VI.

AA *The Kidney dissected.*
B The Sinus *of the* Ureter *about the Kidney.*
C *The round form of the ureters descending from the Kidneys.*
DD *The narrow passages of the ureters.*
EEE *The fleshy Knobs called* Papillares.

FIG. VII.

AA *The common tunicle of the Bladder drawn back.*
BB *The middle tunicle and bottom of the Bladder.*
C *The inner tunicle which appears when the Bladder is cut.*
D *The Orifice of the bladder by which the urine passeth out.*
EE *The Neck of the Bladder which seems swelled by reason of the* Prostatæ *joyned to it.*
FF *Part of the ureters that come to the Bladder.*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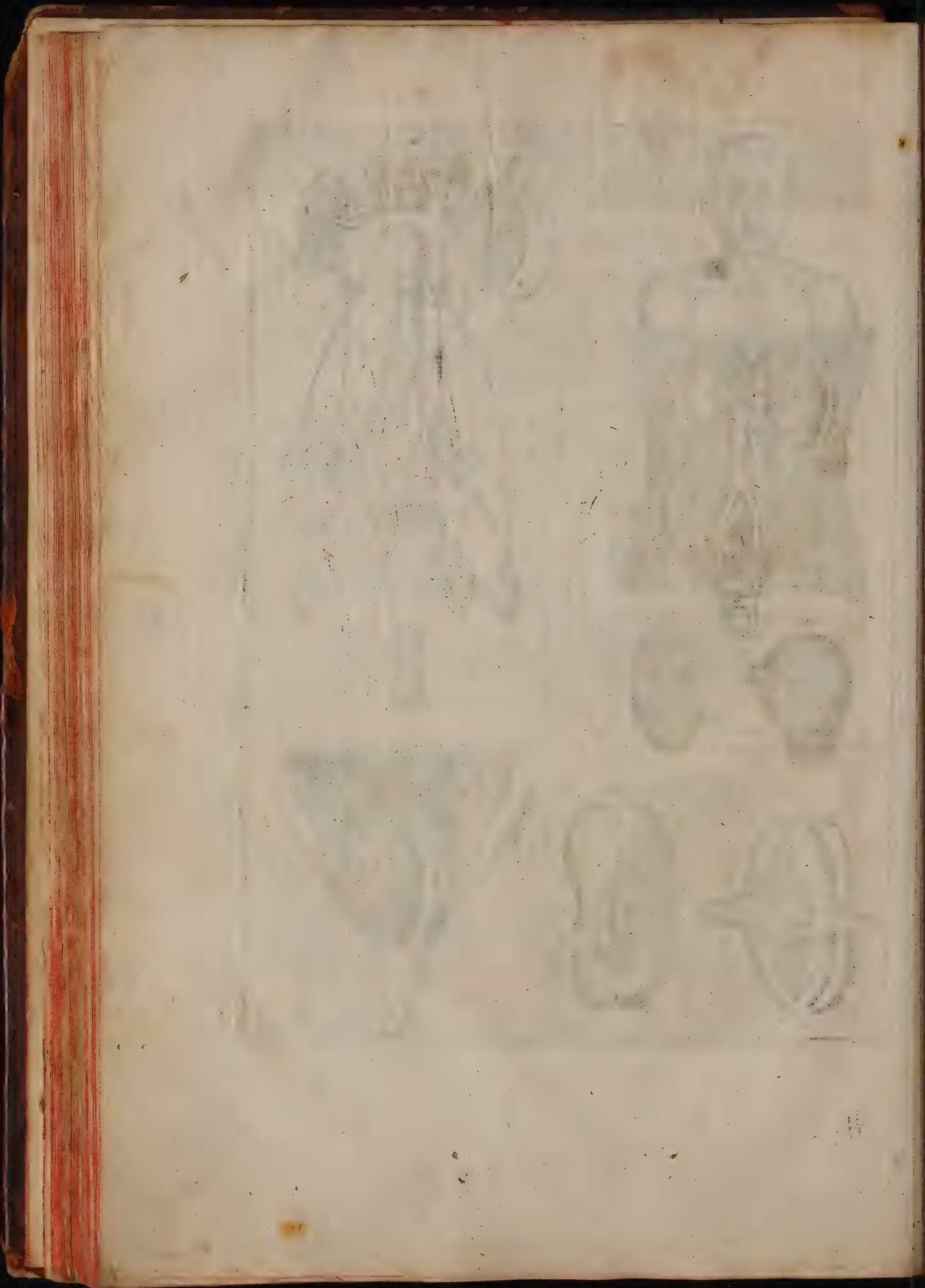


CHAP. 6.

Of the Instruments of Generation in Man.

BY these Organs the Nutriment is wrought or made by which the frail Nature of Man is sustained, which perishing by age is sustained by posterity.

Of these in Men, some perfect the seed, others sow it in the fruitful field of Nature being perfected: of the first are the preparing vessels, the *Pampiniforme*, the *Epididymides*, the Testicles, the *Parastatæ*, the *Vasa deferentia*, and the vessels that keep the seed: Of the latter are the vessels that cast out the Seed and the Yard.

The preparing vessels are two veins, and as many arteries; the right of the veins ariseth most commonly from the Trunk of the *Vena Cava*, either with a single or double root; the left most commonly ariseth from the left Emulgent, so that in their original the scope or pastime of Nature is observed. The Arteries most commonly arise from the Trunk of the great Artery, and pass downward being mixed with the veins; they enter the *Peritonæum*, and by their manifold plexure they make the bodies called *Pyramidalia*; because from a narrow beginning they become broad like a Pyramide; they are called also *Pampiniformia* because they are curled like the Claspers of a Vine, from thence they tend downwards, and are distributed to the *Epidydimis* and the Testicles.

The *Epididymides* are small, white, hard glandulous bodies, covered with the common tunicle of the Spermatick Vessels, they are longish and hollowish, where they are committed to the Testicles, sometimes they are so big that on the one or other side they represent another Testicle; they lie neer to the Testicles, to whose proper Membrane, with very many strings and passages they are joyned; here is also a nexure found about the extremity of each Testicle, for they lie rather in the middle space than stick to them; their office is to give their first rudiments of Seed to the blood the preparing vessels bring in, and commit it to the Testicles for the perfecting of it.

The *Epididymides* are the Testicles joyned, so called, because they witness strength and man-hood; they have a glandulous white and soft substance, having small Veins and Arteries from the Spermaticks, most neatly distributed in them; they have Nerves partly from the internal branch of the sixt pair, which declines the plexure of the *Mesenterium*, partly from the marrow of the back, that they may have sence as well as life and nourishment; they are compassed about with a proper Membrane of their own, strong and thick, which because it is white in color, they call *Albuginea*; the Divine Creator hath formed two of them, that so the work might be done by the other when the one languisheth, or is deficient.

In respect of manifest quality, they are hot and moist, not because they have a fountain of heat which they distribute to the body, for the changes that happen to the Body when they are lost, either in voice, temperament, or strength, comes through defect of any Natural heat flowing from the stones, but from the oppression of that copious matter which useth to be converted into Seed: in form they are almost oval, both for security sake and also for capacity; they hang in men without the *Abdomen* that so they might not be so lustful, and that the matter whereof the Seed is made, might be the better perfected by the length of the passage, to which the Testicles ad strength and fruitfulness.

For it is an error to hold that their hanging down conduceth any thing at all to the casting out of the Seed, because the Seed is received from them, being made fruitful by the ejaculating Vessels which are far remote from them; neither do they change, or any way frustrate the office of the Yard; they contain Seed, but such as is very thin, as is seen by Carcasses not consumed by disease nor fasting, and therefore it receives its last perfections in the Seminal vessels, and *Prostatæ*.

To the *Epididymides* are joyned the *Parastatæ Varicíformes*, so called because they resemble the form of veins when they are swelled, crooked and bowed for the better elaborating of the Seed; they are Nervous and hard in the touching: from these whatsoever is carried upwards into the *Abdomen*, is turned back to the Bladder, and is called *Deferentia*.

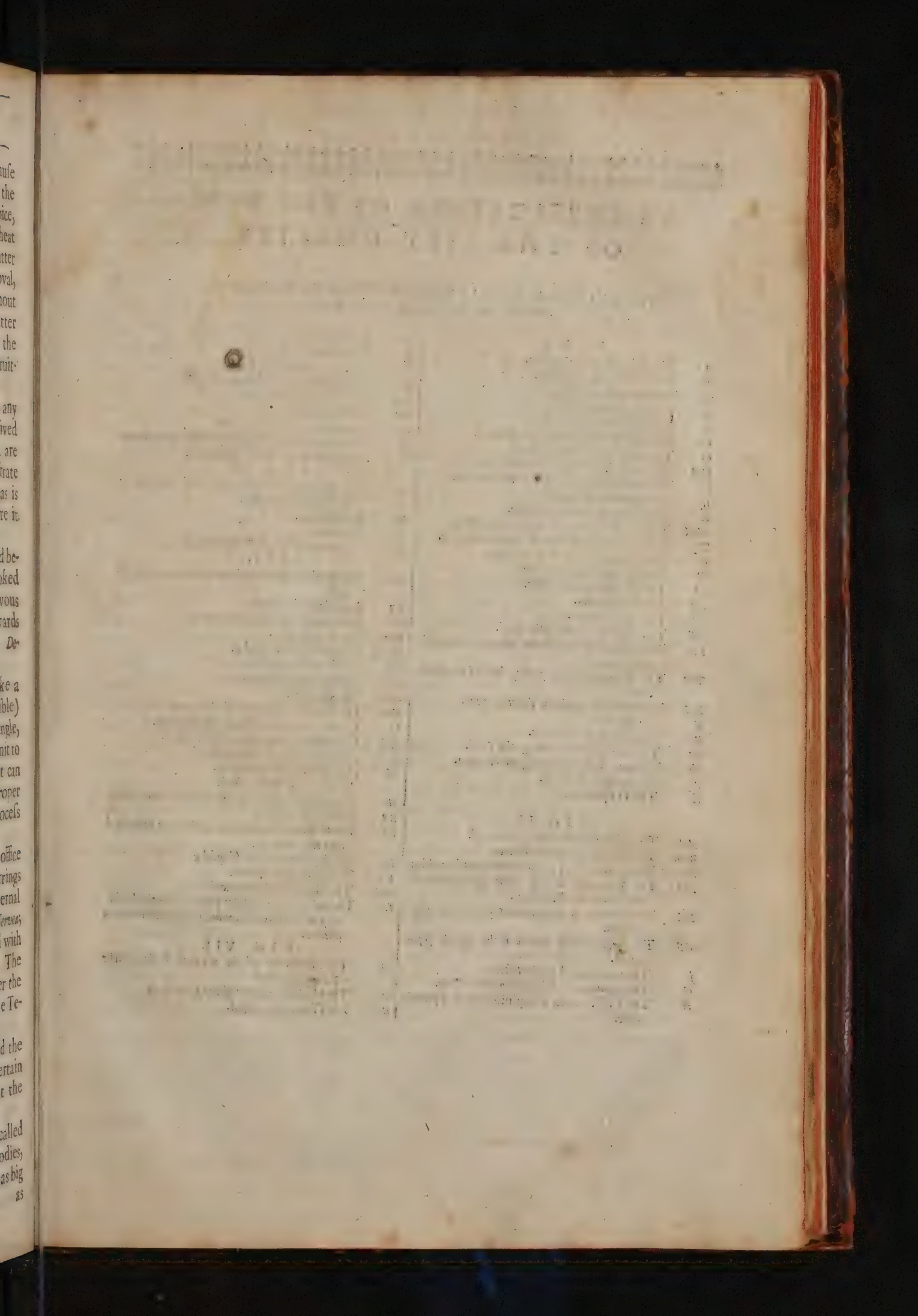
For the security of the Testicles hath Nature provided a thing like a sack or bag, called *Scrotum*, (we in English call it the Cods, and is visible) it is divided by a line in the midst, neither is the composition of it single, for it hath a skin with its scarf-skin, and a *Membrana Carnosa*, close knit to the skin and wrinkled with it, which they call *Darton*, because it can hardly be separated from the skin: after this is the *Elytroides*, or proper Membrane which compasseth the Testicles round, and this is a process of the *Peritonæum*, and is double as the Testicles are.

The external part is furnished with Muscles which from their office are called *Cremasters* or holders up; also from the fleshy texture of strings a red Membrane is formed, which Authors call *Erythroides*: the internal part which immediately compasseth about the Testicles, is called *Nervea*; this being the proper tunicle of the Testicles is sometimes bespread with fat, and so being, is a hindrance to the fruitfulness of the Seed. The Cremaster Muscles arise from the Ligaments of the *Os pubis*, under the transverse Muscles of the *Abdomen*; they hold up the weight of the Testicles, and bring them to the Spermatick vessels.

We come now to the *Vasa deferentia*, which are turned toward the back-side of the Bladder, afterwards by degrees dilated into certain Bladders in which the Seed being perfected is kept, they cast out the Seed into the *Urethra* by a special passage.

The ejaculating vessels are the last of the Spermaticks, which are called *Prostatæ Glanduloſi*, they are two fleshy, hard, and firmly joyned bodies, compassed about with a strong Membrane; it is in bigness, almost as big

as



AN EXPLICATION OF THE TABLE OF THE SIXT CHAPTER.

This Table shews the Spermatick Vessels, the Testicles, the Membranes of the *Scrotum*, the Yard, the Reins and Bladder.

FIG. I.

A The right Glandula renalis.
B The left Glandula renalis.
CC The Reins on each side.
D The left emulgent Vein.
E The right emulgent Vein.
FF The right and left emulgent Arteries.
G The right Spermatical Vein.
HH The trunk of the Vena Cava descending.
I The left Iliack branch of the Vena Cava.
K The right Iliack branch.
L The right Spermatical Artery.
MM The trunk of the great artery descending.
N The right Iliack branch of the great Artery.
O The left Iliack branch of the same.
P The left Spermatical artery.
Q The left Spermatical vein.
RR The left Ureter.
SS The right Ureter.
TT The Vessels preparing the Seed.
tt The same Vessels, in what place the Pampiniformia begin.
VV The Vasa deferentia passing behind the Bladder.
XX The Scrotum with the Testicles in it.
Y The Bladder.
Z The neck of the Bladder.
aa The two Muscles erecting the Yard.
bb The two Muscles dilating the Urethra.
c The Body of the Yard.
d The Præputium.

FIG. II.

AA The skin of the Scrotum separated.
BBB The Membrane called Dartus.
CC The external part of the membrane Elytroides.
DD The Cremaster arising under the transverse Muscles of the Abdomen.
EE The internal or membranous part of the Elytroides.
FF The proper white tunicle of the testicle separated.
f The same joyned to the testicle.
G The Glandulous substance of the testicle.
H The Vessel called Pampiniforme or Pyramidale.
II Epididymis.
K The Parastate.

FIG. III.

œ A portion for the preparing Vessels.
AA The Pyramidal Vessels.
BB Epididymis.
CCC Parastates.
D The testicle covered with its proper Membrane
E A portion of the Vasa deferentia.

FIG. IV.

AA The contexture of the veins and arteries in the Pyramidal Vessel.
BB Epydidymis.
CC Parastate.
DD A portion of the Vasa deferentia.

FIG. V.

A The Bladder laid bare from its outward tunicle.
BB A portion of the Ureters.
CC A portion of the Vasa deferentia.
DD The Capsulæ.
dd The end of the Capsulæ.
EE The Seminal Bladders.
FF The Glandulæ Prostatæ.
GG The Urethra.
HH The Muscles which erect the Yard.
II The Muscles which dilate the Urethra.
KK The two Nervous bodies of the Yard.
L The Prepurium drawn back.
M The Glans with its Bridle.

FIG. VI.

A The internal tunicle of the Bladder being open.
BB Part of the Ureters.
CC The Orifice of the Ureters as they are diducted into the Bladder.
DD The beginning of the Capsulæ.
EE The Seminal Bladders.
GG The Glandulæ Prostatæ divided.
L The hole in the Capsulæ passing into the beginning of the Urethra, which is covered with a shutter.

FIG. VII.

A The Membrane of the nervous body of the Yard separated.
B The blackish marrow of the same body.
C The Glans laid naked.

as a Walnut, and not unlike it in form, one side of it joyns to the *Capsulæ*, from which it receives the Seed, the other side is joyned to the Neck of the Bladder, by many and small passages, and when the Seed is troublsome either by reason of its quantity or quallity, it casteth it out into the *Urethra*.

The Yard was principally ordained that it might cast seed into the bottom of the Womb, it consists of a skin and a fleshy Membrane, without any the least fat, least its motion should be retarded, and the sence of pleasure in the act of copulation taken away by moisture.

It is properly made of two Nervous bodies with the *Urethra*, or vessels through which the urine passeth, and the *Glans*; its body is long, thick, and of a soft substance, as though it were filled with Marrow; It hath a numerous company of Veins and Arteries, that so it might be furnished with heat and Spirit; It is moved by two Muscles, and they are very short, but thick and strong, deduced from the Nervous beginning of the *Coxendix*. The beginning of the Bodies is from the inferiot end of the *Coxendix*, in the beginning they are disjoyned, afterwards in their progresse joyned by inclosure, and stretched to the *Glans* of the Yard.

Under these is the *Urethra*, or channel, which is the passage both of urine and seed; it is composed of two Membranes, of which the internal is thin and exquisite in Sence, which causeth both pleasure and pain; the external is thick endewed with transverse *Fibræ*, both for motion and strength sake; the *Urethra* hath two Muscles pretty long, yet slender, their original is from the *Sphincter* of the right Gut, they terminate about the middle of the channel, and dilate it the readier to expel the seed.

In the beginning of the *Urethra* is a fleshy shutter, which shuts the Orifices of the *Capsulæ*; this being either broken by unadvised putting a *Cattheter* into the Bladder, or else gnawn asunder by sharpness of excrements causeth an uncurable *Gonorrhæa*, or running of the Reins.

Famous vessels are communicated to the Yard, Veins, and Arteries, from the Hypogastricks and *Pudendæ*, whereof the one is distributed by the external Skin, the other by its Nervous Bodies; to these is added a double pair of Nerves from the *os Sacrum*, of which the one is distributed to the Skin, the other to the inner part of the Yard.

The extremity of the Yard is called the *Glans*, of a fleshy, soft, and Spongy substance, it is covered with a thin Membrane, that so it might be the softer to feeling, and the more exquisite in Sence.

A great part of it is covered with the common coverings of the Body, which is called *Preputium*, or the fore-skin, which is tied to the under-part of it by the Bridle; this fore-skin grows immoderately in young Children in *Egypt* and *Arabia*, that either for Religion sake, or fear of other disadvantages that might thence ensue they cut it off: such as devote themselves to Chastity, hang a Ring in that part which remains.

Place here the Table of the sixt Chapter, which hath the Number 6. at the corner of the brass Plate.

CHAP. 7.

Of the Instruments of Generation in Women.

THE preparation of the Instruments of Generation, is no less in the Body of Women, than it is in the Body of Men, for there are those by which the Seed is produced, and mixed with the Seed of Man being produced, and stirred up for the Generation of the Child; such as regard the Seminal matter are the preparing vessels, the Testicles, the perfecting vessels to which those that cast it out are joyned. The Womb is for the Conception of the Child.

The preparing vessels are two Veins, and as many Arteries as they are in Man, the right of the Veins proceeds from the Trunk of the *Vena Cava*, the left from the Emulgent. The original of the Arteries, is from the great Artery, and yet in the beginnings of those, the work of Nature is various, as it is in those of Men: these vessels joyn themselves in their progresse, and yet still remain within the *Abdomen*, and are carried partly to the Testicles, partly to the *Tubæ* of the Womb; its bottom and Neck in which turning themselves upwards by the Hypogastrick vessels, they joyn by *Anastomosis*, and so they subministers matter not only to breed the Child, but also to nourish the parts.

The Testicles of Women are of a Glandulous substance, softer, and fuller of juyce then Mens are, in such as are young, but lesser, and harder in such as are Ancient; they have only one single Skin, but that is very strong, and fastened to the Ligaments of the Womb; about the bottom of it; they have an evident passage to the bottom of the Womb, though it be but short, and another more slender, and not so easie to be seen, to the Neck of the Womb.

There are neither *Epididymides*, nor yet *Paraſtatæ* about the Testicles of Women; for the Seed of Women needs not that exquisite digestion that the Seed of Man doth, for the constitution of it is perfect, seeing it gives fit matter to make the Fruit.

Neither yet doth Womens Testicles stand only for ciphers neither, for they receive the matter from the preparing vessels, and turn it into a watry milky substance; as is copiously found many times in their dissection, especially in such as were young, and flourishing when they died: This Siminal juyce is carried from the Testciles, partly to the *Tubæ* by small passages like the *Venæ Lacteæ*, that there it may be perfected; partly to the bottom, and Neck of the Womb, that it may keep them soft and moist, and as the Ancients think to stir the Women up to Venery; although this is only in hotter Natures, and such whose passages are streighter.

To the bottom of the Womb which toucheth the Testicles, the portion

tion of Spermatical moisture, the Child being now conceived, is of farre Nobler use, for it bears up the Child, and keeps it from the violent heat of the Womb, and sustains it, that the umbilicar vessels which at first excel a Hair not much in bigness, be not broken by the shaking of the Mothers Body.

The vessels which keep the Seed, and cast it out, are called *Tubæ*, they are two round Bodies joyned to the bottom of the Womb on each side, they are called *Tubæ* because of their crooked bowing like a Trumpet, they are composed of two Membranes, which are common also to the Womb its self, they have Veins & Arteries from the Spermaticals, which are divided into small branches, and Nerves from the same, which creep to the bottom of the Womb. Lastly, as we shewed before, there is a Nervous passage inserted into the bottom of the Womb, which is very seldom extended beyond the longitude of the *Tubæ*.

About the Womb are no *Prostatæ*, nor needs there, because they are no divided Bodies, but joyned by the *Tubæ*, and the Seminal moisture passeth easily into the Womb, as you may easily perceive, if you do but crush one of them with your finger. Obstructions are freequent in the *Tubæ*, as well as in the Womb; as also swellings, which out of question are causes of Barrenness.

Such Women as are fruitful have a twofold Spermatical matter, the one watry, which moistens and refresheth the Womb, and Fruit in it, the other which is thick in the *Tubæ*, which is mixed with the Seed of Man to make the Conception.

To receive and preserve both Seed and Fruit, is the Womb ordained, it is a part of the inferior Ventricle composed of two Membranes, that so it may be stretched wide when the Child is in it, and contracted again when it is Born; the exterior Membrane it hath from the *Peritonæum*, which is strong, and out of danger of breaking, the interior which is propper to the Womb, is full of strings and pores: between these Membranes a fleshy contexture compasseth both the bottom and Neck of the Womb, which in the time of Conception like a Sponge drinks up the superfluous moisture, and is of a wonderful thickness when the Woman is with Child, but else very compact.

Also it sometimes happens, that when the Womb is narrow, and the Child great, or a Mole bred together with the Child, with mighty pain in Child-bearing, not only the thick, but also the thin substance of the Womb with its Membranes is broken, and the child breaks out with its Head, Feet, and Hands, wheresoever there is way made into the *Abdomen*, and sometimes it falls down with its whole Body upon the Mothers Bowels.

The Womb hath a numerous company of vessels, of which the Veins which accompany the Arteries on the upper part of it, descend from the vessels which prepare the Seed; the middle and inferior parts are supplied from the Hypogastricks, which creeping upwards again, joyn themselves by inosculations to the fore mentioned vessels; the Nerves which come to the superior part of the Womb, are the extream branches of the costal Nerves of the sixt pair; the middle and inferior part is supplied from the *Os Sacrum*.

Not only age, but also the Sports of *Venus* and breeding Children alters the bigneſs of the Womb: the intertexed fleſh, and the plenty of Blood flowing thither, alters the cold and dry temper of the Membranes, which is ſo plentiful, that it adminiſter nouriſhment to the Child, and flows out monthly at other times: Its ſcituation is in the lower Region of the *Abdomen*, where by the concourſe of the *Os Sacrum*, *Ilium*, *Coxendix*, and *Pubis*, the *Pelvis* is framed, and for this intent it is larger in Women, than it is in Men, and gives way about the *Os Sacrum*, and *Pubis* (though the Ligaments be very ſtrong) in the time of travail; forward it is joyned to the Bladder, and the *Os Pubis* by the help of the *Peritonæum*, backwards with the right Gut.

Above it hath ſingular Ligaments, and very ſtrong, but looſe, leaſt they ſhould be detrimented by the ſwelling of the Belly when the Woman is with Child; the firſt of theſe which is in the ſides, ſeems to be a ſtretching out of the *Peritonæum*, it is Membranous, and broad, ſo that it bends the *Tubæ*, Teſticles, and womb, to the *Os Ilium*, and is like the wing of a Bat, or Flitter mouſe; this being immoderatly looſned, or broken by violence, the bottom of the womb falls down upon the Neck, or elſe into one of the groynes.

The other Ligament is round and Nervous, produced forwards from both ſides of the Bottom, and having pierced the *Peritonæum* and joyned it ſelf to the Tendons of the Muſcles of the *Abdomen*, above the *Os Pubis*, it dilates its ſelf into a Membrane, joyns its ſelf to the *Clyſtoris*, and looſly binds the bottom of the Womb to the foreparts; but indeed this round worm-like Body is ſomething elſe beſides a bare Ligament, for if you diligently mark its ſtructure, it conſiſts of a double Membrane, even as the Womb it ſelf doth: it takes its original at the bottom of the Womb, where the *Tubæ* and Teſticles are: It is porous within, and towards the end it is evidently hollow, and moiſt, with a watry Seed in ſuch Women as die a violent death, and therefore it is more probable that this Worm-like veſſel, when the mouth of the Womb is ſhut, gives paſſage to the Seminal Matter from the Teſticles to the Neck of the Womb, and caſts out excrements by thoſe paſſages from both Groyns.

The office of the Womb is to receive the Seed, which is the principal of Generation, to keep and cheriſh it being received, and to bring forth the child into the world, all which it doth by its proper faculty: this will appear more cleerly if we conſider the parts of the womb diſtinctly.

It is divided into the bottom, the Neck, the paſſage, the extremity of which is the Womans Privities. The uppermoſt part of the Womb is called the Bottom; it is thicker and harder in thoſe that are not great with child, the hand will eaſily graſp the bigneſs of it: outwardly it reſembles the form of a Guord, being rather compreſſed than exactly round, if the Woman hath never been with Child; it hath a ſmall Cavity within, and but one, which is divided into the right and left by a very ſmall line; and yet in this ſecret little ſhop, the Eternall Creator of all things begins and furniſheth the

the admirable Structure of Man, only by a few drops of Seed.

Where the Womb begins to grow narrower, that is called the neck, and this usually Authors confound with the passage: in this is the Orifice of the Womb, called internal, very smal; it is broadish in Virgins and Women which never had child, but round in such as have; this opens to receive the Seed, and shuts close when it is received, and it stretcheth to an extream wideness to give passage to the Child.

To the bottom of the Neck is joyned the passage which is usually called the Neck of the Womb; it is a soft and loose channel with unequal wrinkles, that so it may the better give intromission to the Yard of Man, and extromission to the Child; at the end of it, on the forepart, it receives the neck of the Bladder; behind it is strongly bound to the *Sphincter* of the right Gut.

The remainder of it is terminated in the Privities, in which the two lips are external, then the fleshy and soft productions which Authors call *Nymphæ* and *Alæ*; by these it is defended from external injuries: between these *Alæ* is the *Clytoris*, a small round Body, made up of two Nervous portions, spongy within; it is endewed with two Muscles on both sides, they are very small, but their office is the same with those that dilates the passage in males; it hath plenty of vessels of all sorts, and is very exquisite in sence, that so by tickling it may cause pleasure in the act of Copulation.

Its unprofitable excrement (which the *Arabians* call *Endemium*, the *Egyptians*, *Malum*) which sticks out immoderately in young Girls, they cut off and scar: Under the *Clytoris* toward the internal part of the passage is the passage of Urine, which is short in Women, and hath a smal *Caruncle* to defend it from cold.

Such Virgins as keep themselves from playing the wantons with themselves, from the use of *Venus* and other external injuries, have a fleshy skin that covers the passage, guarded with *Caruncles*, which Ancients called *Hymen*; it hath a cleft in the middle through which the Terms monthly flow, the form of which quite ceaseth after they have had to do with a Man, and born Children; this as it is in Infants, and such Virgins as are not Marriagable, we give to the view of such as have chast minds in the fift and seventh Scheam of the next Table. In these, whatsoever is extended upwards by the sides from the inferior angle of the Privities, contains the cleft, and is a laying open of the internal tunicle of the passage, which is Membranous with many very smal Veins and Arteries, which in Virgins makes up that fleshy circle like a flower; it is more fleshy in some than it is in other some, so that it represents the form of two *Caruncles*: It is commonly thin, and the weaker by reason of the defluxions of humors, so that it is broken without much ado. Two fleshy Productions like mirtle Leaves are neer this skin, or else like Almonds, which make the passage the narrower in Virgins, by which, the *Caruncle* which compasseth about the passage of the Urine is seen.

These things by the Law of Nature being thus constituted, Nature being

ing careful for the defence of Virginity, sometimes frames another thin skin from the inferior angle of the Privities and the sides, which is stretched cross the chink like a zone, neither gives it any passage save only neer the passage of Urine, where it is loose and severed from the parts of the Privities: This, men very skilful in Anatomy, have formerly described for the *Hymen*; this is but in few, and many Midwives tear it away for an unprofitable excrement: See its form in the sixt Figure of the following Table.

Place here the Table of the seventh Chapter, which hath the Number 7. at the corner of the brass Plate.

CHAP. 8.

Of the Fruit in the Womb.

TO the Body of the Mother we adjoyn the contemplation of the fruit in the Womb, because it is a part of it though temporary, as not only the community of substance and nourishment, but also the nexure of the Secundine and Umbilicar vessels to the Womb witnesseth; this Fruit we consider as genuine, and nourished by the Womb, and as being fitting to breath the air, it breaks out from that narrow inclosure.

The small Body of the *Embrion* is formed by the vital vertue of the Seed of the Man, from which office it is called *Plastica*; of which, by the appointment of God himself, by his infinite wisdom, goodness and power, he hath left not only obscure foot-steps, but also cleer arguments; to this, the heat of the Seed and Nourishment from the Mother administers: the *Compendium* that doth this great work is very small, not exceeding the bigness of a great Emmet; from which, that is first formed, without which life cannot be preserved, to wit, the Heart, and from it the veins and arteries as from their *Basis*, afterwards the Liver, and then other parts which come first into use.

That the Heart is first formed before any other part your eyes will witness, if you dilligently contemplate the framing of the *Embrion* in Eggs; and although the Heart be very little and altogether white, yet

by

by reason of the blood contained in each Ventricle, it hath a transparent redness to be distinguished from the other parts: The motion of the Heart helps and confirms this, for so soon as any blood is to be seen in the Veins of the *Embrion*, the Heart being full of blood moves with a swift, yet ordinary pulse; so often as it is dilated it receives blood into its Ventricles; so often as it is compressed, it casts it out, and this appears in the Heart whilst it is white, though something increased. Besides, it must first be formed by reason of its singular plenty of heat, which no other part of the Body is equally endewed with. Lastly, necessity requires its first formation, that so by its motion the vital Spirit may be stirred up, increased and distributed to the Body.

The matter of which the first forming sisteme of the Body is produced is the Seminal substance in the Body of the Mother, which passing from the *Tubæ* to the bottom of the womb, to which the Seed of the Man ads heat and Spirit, and to the increase and maintaining of it is the Blood of the Mother required; this comes not at all to that first mixture from the Seed, neither doth it make any *Parenchyma*, but after an interval of time, the Umbilicar vessels and Heart being framed it is drawn and takes its redness with the Muscles.

Of the parts procreated, some lose their use, others retain it so long as life lasteth; such as lose their use are, the Navil and its Vessels, the the Membranes which compass the Child in the womb, and the *Placenta*; the use of these ceaseth so soon as the Child is brought forth to light.

The Navil is a Membranous ducture, by which the Vein and Arteries arise from the child to the Mothers Womb; both this and the Secundine wants Nerves because they have no use of sence: It is of a famous length, even in the very beginning of the Formation, although the bigness of the *Embrion* at beginning be no bigger than a great Emmit, or a small Bee; but when the Fruit is ready for extramission, the Navil-string is three spans long, and as thick as ones finger, both for the strength of the Vessels, the perfectiug of the blood by its long passage, the commodious motion of the Child, and the easier drawing out the Secundine; it hath no distinct nodes, yet is it wreathed and unequal, for the easier bowing of the included vessels.

The rise of the Navil, is from the middle of the *Abdomen*, that the inclination of the Head and Breast of the Child might be the readier towards the mouth of the Womb; at the biginning of the *Embrion* it swims in the Liquor of the *Amnios*, but when it is more perfected it is bowed for the most part above the Breast, and produced backwards by the hinder part of the Head to the Fore-head, and joyned to the womb by Membranes and the contained Vessels.

The Vessels contained in the Navil, are, one vein and two arteries; the vein is largest, and takes its Original from the Foundation of the *Vena porta* within the Liver, therefore it descends by the Arteries of the Liver to the Navil, and being divided into very many branches above the *Chorion*, it joyns its self to the Womb, and carries Blood for the nourishment of the Infant: The Umbilicar Arteries take their Original from the

the Iliack branches of the great Artery, from wch place being ſtretched upwards by the ſides of the *Urachos*, they enter the Navil, and are manifoldly diſtributed above the *Corion* with the Veins, they carry vital Spirit, and communicates it to the Child.

It is farre enough off from truth that theſe veſſels paſſe to the Child from the Mothers womb, and the Membranes adjacent, for in the young ones of Birds, it is eaſie to be ſeen that Nature deduceth the Veins and Arteries, from the Fruit it ſelf incloſed in its Secundines, and by degrees divideth them into leſſer branches; It doth the like in vegetables, whoſe roots come not from the Earth to the Plants, but the Plants ſend them to the Earth for nouriſhment, and this is abundantly proved in Bulbous roots that grow out of the Earth; neither comes this opinion neer the truth, that the Arteries & umbilicar vein are framed before the Heart and Liver, for neither Heart nor Liver is made of Blood, but of Seed, and the whole Syſteme of the Body is made before any veſſels paſſe from it; for before the Bowels are formed, there is no need of veſſels: as the Conception of living Crearures, and the Seeds of Plants evidently demonſtrates.

The *Urachus* is added to the Umbilicar veſſels, being a Membranous Body, round and porous within, ariſing from the Baſis of the Bladder, and attenuated towards the Navil, it delivers the Urine from the Bladder to the *Amnios*, and yet this ſeems doubtful to theſe who behold the ſolidity of this veſſel, the ſmalneſs of its pore, and the obſcurity of its paſſage out by the Navil; but ſo ſoon as the Infant is born, whatſoever of the Navil ſtring is left to the Body after it is cut off, its former uſe ceaſing, is turned into a Ligament.

The Membranes which compaſs about the Child in the womb, are two, of which, that which is next the Body of it is called *Amnios*, being ſoft, light, and cleer, gently joyned to the *Chorion* where the *Placenta* is; from the very beginning of the Conception, it contains a watry Liquor, which defends the tender Limbs of the *Embrion* in the violent motions of the Mother,; and in the labour of the Mother the Membranes being broken, it mollifies the paſſages, and gives the eaſier extramiſſion to the Child: that this is gathered together between the Membranes, *Amnios*, and *Chorios*, the connexion of the Tunicles, and dilligent obſervation denies; neither can there come any detriment to the Child, from the ſharpneſs of this humor, ſeeing the *Cuticula* eaſily defends it.

The other Membrane they call *Chorion*, and it compaſſeth the whole Child round, on the outſide of the *Amnios*, and is the thicker of the two by odds, it is ſmooth on the inſide, and is furniſhed with abundance of the Umbilicar Veins and Arteries; In which place (the Child encreaſing) the Liver or *Placenta* of the womb ariſeth; in Figure it is a ſoft and Spongy peice of fleſh, and hath many branches of the Umbilicar veſſels, both to cheriſh its heat, and nouriſh its ſubſtance.

To theſe they add the *Allantoes*, or Skin in which the Urine is kept, although this appears in the Anatomy of Bruites, rather than of Women.

To theſe Membranes Ancient Authors defend and prove mightily, and

and as mightily disagree about certain vessels called *Acetabula* and *Cotyledones*, which some say are, some say are not joyned, some hold them to be the mouths of the vessels swelled with Blood, other pieces of flesh between the *Chorion* and the Womb, which prop up the Umbilicar vessels, and receive the Blood when it flows too fast to the Child, which is conspicuous in the Wombs of Sheep, and the like Creatures.

If we search out what answers to this in women, you must look to *Placenta* before described, which being hollow on that part next the *Chorion*, convex on that part which is next the womb, represents the same form, only it is far bigger, and by the softness of its substance, and multitude of its vessels, performs the same office: These are the parts of the Child which are useless after Birth, and are called the After-birth or Secundine.

The parts of the Body which continues still in office, the Child being born, are the same which are in the Ventricles, the unlikeness of wch the child in the womb, to a mans of age, is here to be spoken off, the Ventricle of the Child in the womb, though it be contracted, yet is it never Empty, but alwaies white and covered over with the Liver. The Guts are seven times as long as the Body, and the Gut called *Cæcum* is filled with excrements; the excrements of the small Guts are Flegmatick and yellow, those in the great Guts solid and hard, which the Ancients called *Meconium*: the Liver appears great, and stretched out even to the left *Hypochondrium*, the substance of it before it grows red, may be seen full of purple Veins, and the Gall under it appears yellow, and swelled: The Sweet-bread is large, and by its bright colour evidently shew the diduction of Chyle, and yet it shews it more cleerly after the Child is born, whilst it sucks. The second Table of this Chapter presents you with its delineaments.

The *Glandula* of the Kidneyes are of a wonderful bigness, and lye not in the Reins, as they do in such as are grown up, but lye upon them, and embrace the superior part of them; the reins themselves are great, and have very many *Glandulæ*; the Ureters are wide, and the Bladder full of Urine; the bottom of the womb in young Wenches is compressed, and the *Tubæ* stretched out, the Testicles great, all which the Second Figure in the forementioned Table Specifies.

The Bowels of the *Abdomen* which are allotted for publique digestion, do not want private digestion, but manifestly operate for the common profit of the Infant; for that the Stomach makes Chyle, is manifest by the matter contained in it, and by the various excrements in the foldings of the Guts: Although the Sence of Man cannot yet perceive by what passages the substance to be converted into *Chyle*, comes to the Stomach: The fancies of the Ancients that the Child sucked in at its mouth, being exploded for many difficulties, yet is it agreeable to reason, that as in Men, the Liver and Spleen receive whatsoever is to be turned into Blood, so whilst the Fruit is nourished in the womb, the passage of the throat being denied, the Stomach should draw that from the Liver and Spleen which it digesteth, and turneth into *Chyle*; that the Liver makes Blood in the Fruit is cleer, by the separation of the

Chollerick and watry excrement, for although the Blood of the Mother by which the Embrion is nouriſhed be pure, yet is it unlike to the temperature of the Fruit, and therefore ſtands in need of another ſeparation and change.

About the Breaſt, the Veins are very full of Blood; but the moſt notable thing in the Heart is, there is a large paſſage out of the *Vena Cava* into the *Arteria Venoſa*, or an anaſtomoſis, defended with a Membrane; alſo a ſmall channel out of the *Vena Arterioſa* into the great Artery, ſo that the Blood may readily paſſe from the right ventricle of the heart into the left, theſe paſſages as age comes, Nature ſtops up by degrees, unleſs ſome great obſtructions of Flegm (as ſomtimes happens) ſtop up the vulgar paſſages: the Heart it ſelf is great, and its ears and veſſels large, the Lungues ſeem Bloody, neither have they as yet obtained their rariety, becauſe of their reſt, and yet their Birth being neer, and the place they move in growing looſe; the Lungues grow lighter, and gently draw in ſome air, and this is cleer, becauſe ſometimes a ſound is heard of the Fruit, not only in Bruits, but alſo in Women.

The Heart moves in the *Embrion* ſo ſoon as the Mothers Blood flows to it, which it perfects within its Ventricles, and endews it with vital Spirit, that ſo it may preſerve and ſtir up the faculties of other parts, the parts of the Ears of the Heart is diſtinct in reſpect of time from other parts, for they firſt of all compel the Blood into the Heart by compreſſing themſelves, then by dilating themſelves draw Blood again.

As for the Head, the neerer a Child is to Birth, the heavier it is, it is diſtinguiſhed by certain great Bubbles, which to the beholders gave opinion, of the three Regions of the whole Body, the balls of the Eyes are great, and ſtick out; the Brain is almoſt fluid, and the Nerves very ſoft; the Bones of the Skul like tender barks, and if you except the fore-head, diſtinguiſhed by no Sutures. The Crown is covered only with a thin Membrane, till the Bones of the fore-head, and hinder part of the Head are joyned, the paſſages of hearing, with the adjoyning Bones, *Os Cribroſum*, and the Horns of the *Hyois* are Cartilaginous.

And yet (which is ſtrange) ſuch Children as are brought forth in the ninth month; the hardneſs and greatneſs of the Bones of the paſſage of hearing, is almoſt equal to thoſe in Men of perfect age, and not theſe only, but that alſo which is called the *Tympanum*; the Membrane of which is comprehended with the ring-like Bone, which gives the foundation of hearing; alſo the Labyrinth and *Cochlea* are not leſs in bigneſs, than by proportion of Figure, to perfection, whence it is cleer, that a Child ſooneſt obtains perfection of Hearing.

The Bone called *Cuneiforme*, is divided into four parts; the Bones of the fore-head, and inferior Cheek, are manifeſtly divided. The teeth lies hid in the Jaws, leaſt the Child in ſtead of ſucking, ſhould bite, the roots of them are ſoft and mucous, and hide the Fundamentals of the ſecond Teeth.

The *Vertebræ* have no proceſſes, but conſiſts of three diſtinct Bones, of which the foremoſt which is the greateſt, is like a Lupine; the two hinder are leſs, and by their meeting make that hole for the Marrow of the Back,

AN EXPLANATION OF THE FIRST TABLE OF THE EIGHT CHAPTER.

AN EXPLANATION OF THE FIRST TABLE OF THE EIGHT CHAPTER.

The Fruit in the Womb being often helped by Physical Remedies, requires no less diligent observation than the Body it self of Man: therefore we have given you the representation of it in two Tables according to the Method of Dissections. The first of which, laies open to your view the Umbilicar Vessels, and the *Sceleton*: The other the Deliniament of the Bowels.

FIG. I.

Shews the Child ready to be born, as it lies in a fit posture for extramission.

AAAA *The parts of the* Abdomen *dissected and distracted.*
BBBB *The body of the womb divided into four parts*
CCCC *The* Chorion *and* Amnios *joyned together, and dissected into four parts.*
D *The Child turning its head downwards, which is the natural way of Birth.*

FIG. II.

Shews the Child taken out of the Womb, the Umbilicar Vessels, and Membranes separated about the beginning.

A *The Umbilicar vein distended from the liver.*
BB *The two Umbilicar Arteries rising to the Navil.*
C *The* Urachus *knit to the Navil.*
DDD *The Navil produced even to the* Placentum.
EE *The* Amnios *separated from the* Chorion, *under which a portion of the Navil appears.*
FF *The* Chorion *divided into four parts.*
GGG *The Umbilicar veins and arteries, distributed in the* Placenta *which are extended above the* Chorion, *but very lucidly appear under it.*

FIG. III.

Explains the Secundines, in what part they cleave to the womb.

AA *The convex part of the* Placenta.
BBBB *The* Chorion *under the* Placenta.

FIG. IV.

Shews the Bones pertaining to the Head.

AA *The bone of the Fore-head distinct from the Suture.*
BB *The two bones of the fore part of the head.*
C *The Crown as yet Membranous by reason of the distance of the Bones.*
D *The inferior cheek divided into two parts.*

FIG. V.

Shews the ring-like bone of the Infant, to which the Membrane of the Ear called *Timpanum* is knit.

FIG. VI.

The bones of the Ears, removed a little from their Natural Scituation.

A *The* Malleus.
B *The* Incus.
C *The* Stapes.
D *The little bone annexed to the Ligament of the* Stapes, *first found out by* D. Sylvius.

FIG. VII.

Exactly represents the Labyrinth and *Cochlea* of the Ears perfect in all parts.

A *The Oval hole in the* Tympanum, *which looks toward the Labyrinth.*
B *The round hole in the* Tympanum *between the Labyrinth and the* Cochlea.
CCC *The three bony Cavities of the Labyrinth.*
DD *The* Cochlea.

FIG. VIII.

Shews the internal face of the *Cochlea* with the Labyrinth.

A *The oval hole.*
B *The round hole.*
CCC *The three circles of the Labyrinth something opened.*
DD *The* Cochlea *broken, shewing the little inward porous circle.*

FIG. IX.

The *Vertebra* of the Infant in three distinct parts.

A *The first back part.*
B *The second back part.*
C *The third fore part.*

FIG. X.

Shews the *Vertebræ* of the Neck, the bones of the Breast as they are seen on the fore part.

A *Denotes only the upper part of the* Sternum, *the rest are under it.*

FIG. XI.

Shews the back, and its *Vertebræ*, wanting their Processes.

FIG. XII.

Shews the *Vertebræ* of the Loyns with the bones that make the *Pelvis.*

A *The five* Vertebræ *of the Loyns, whose Processes are yet cartilaginous.*
B *The Os* Sacrum *composed of six parts.*
GC *The bones called* Ilium.
DD *The bones of the* Pubis.
EE *The bones of the* Coxendix.

FIG. XIII.

Expresseth the bones of the whol hand.

a b d *The Appendices of the bones, yet cartilaginous.*
c *The bones of the wrest all cartilaginous.*

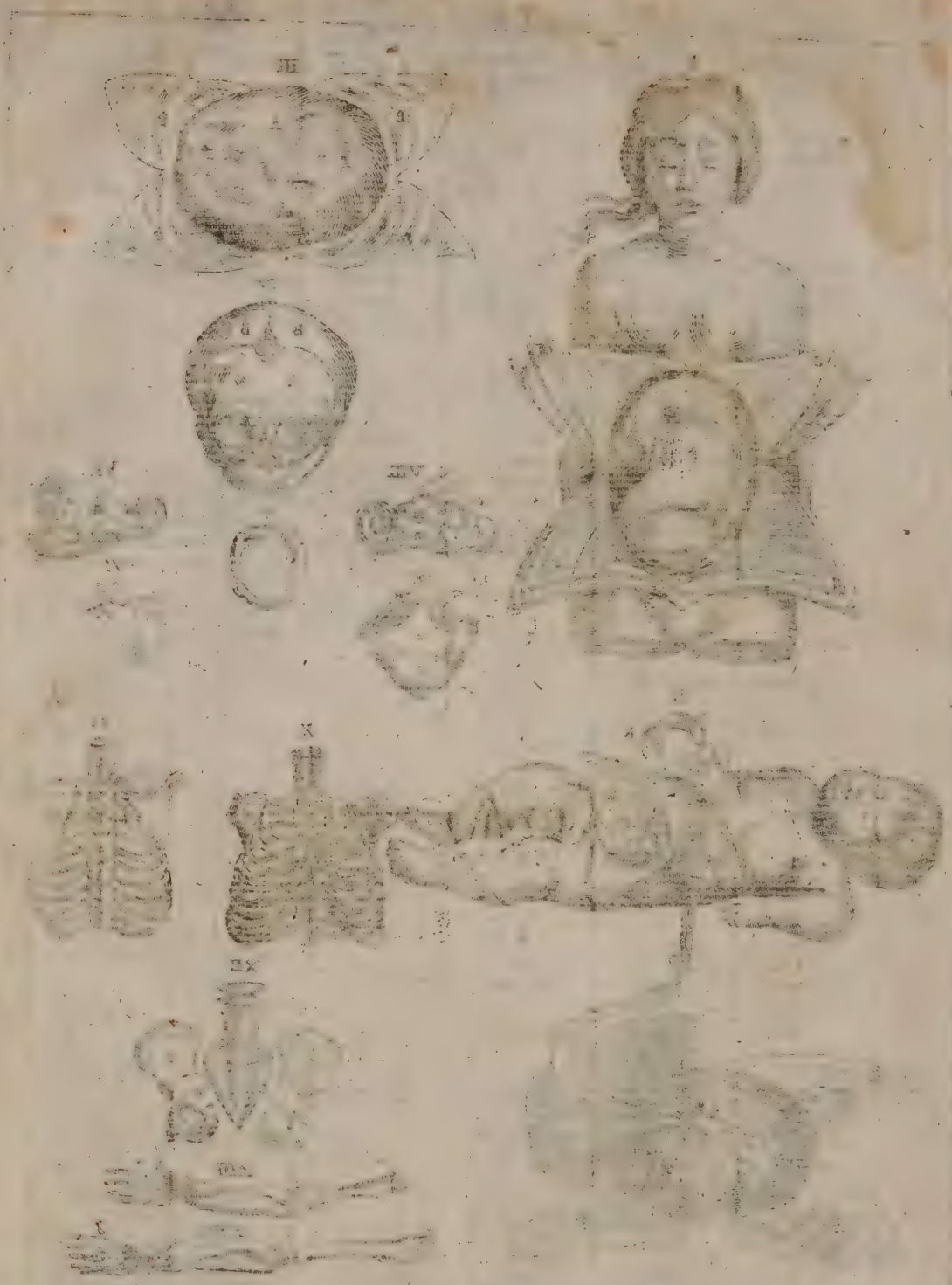
FIG. XIV.

Represents the bones of the whol Foot.

a b d *The Appendices of the bones which are cartilaginous.*
c *Certain Cartilaginous bones of the Instep.*

8.

Peter Archer
His Book



THE SECOND TABLE OF THE EIGHT CHAPTER UNFOLDED.

This Table comprehends all the Bowels which are found in the *Abdomen*, and Breast of the Infant.

FIG. I.

Singularly expresseth the Lacteal Veins, as they are represented at a single view.

AAA The hollow part of the Liver.
B The Gall.
CC The umbilicar vein bowed upward.
DD The Stomach turned upwards.
E Its lower Orifice tyed with a string.
F A portion of the Jejunum cut off neer the Pylorus.
GGG The Pancreas of a famous bigneß.
H The Spleen.
II The right Kidney covered with the common Membrane.
K The left Kidney in like manner covered.
LLL The Meſenterium ſtretched abroad.
MM &c. The Guts knit to the Meſenterium.
aaaa Certain Lacteal veins ſtretched from the Sweet-bread to the Liver, whereof few, and thoſe the leaſt of them are here expreſſed.
bbb &c. Lacteal veins diſtributed from the Sweet-bread to the Guts, and thoſe bigger.
ccc &c. The Meſeraick branches of the Vena porta.
dd &c. Branches of the Meſeraick arteries.

FIG. II.

A The right Renal Glandula.
B The right Kidney.
C The left Glandula of the Reins.
D The left Kidney.
E The Vena Cava deſcending.
FF Its internal Iliack branches.
GG The external Iliack branches of the Vena Cava.
HHH The great artery with its external Iliack branches.
II The internal branches of the great artery.
KK &c. Both umbilicar arteries bent downwards.
L The bottom of the womb compreſſed.
M The neck of the womb.
N The bladder turned downwards.
O The Urachos.
P The node of the Navil cut off.
a The vein of the right Renal Glandula.
b The artery of the right Renal Glandula.
c The right emulgent artery.
d The right emulgent vein.
e The right ſpermatical vein.
f The right ſpermatical artery.
g The left artery of the Renal Glandula.
h The left vein of the Renal Glandula.
i The left emulgent vein.
k The left emulgent artery.
l The left ſpermatical vein.
m The left ſpermatical artery.
n n The Veſſels preparing the Seed.
o o The teſticles of a great magnitude.
p p The broad Ligaments of the womb.
qq &c. The Tubæ of the womb bowed down.
rr The round Ligaments of the womb cut off below.
ſſ Portions of the Ureters cut off.

FIG. III.

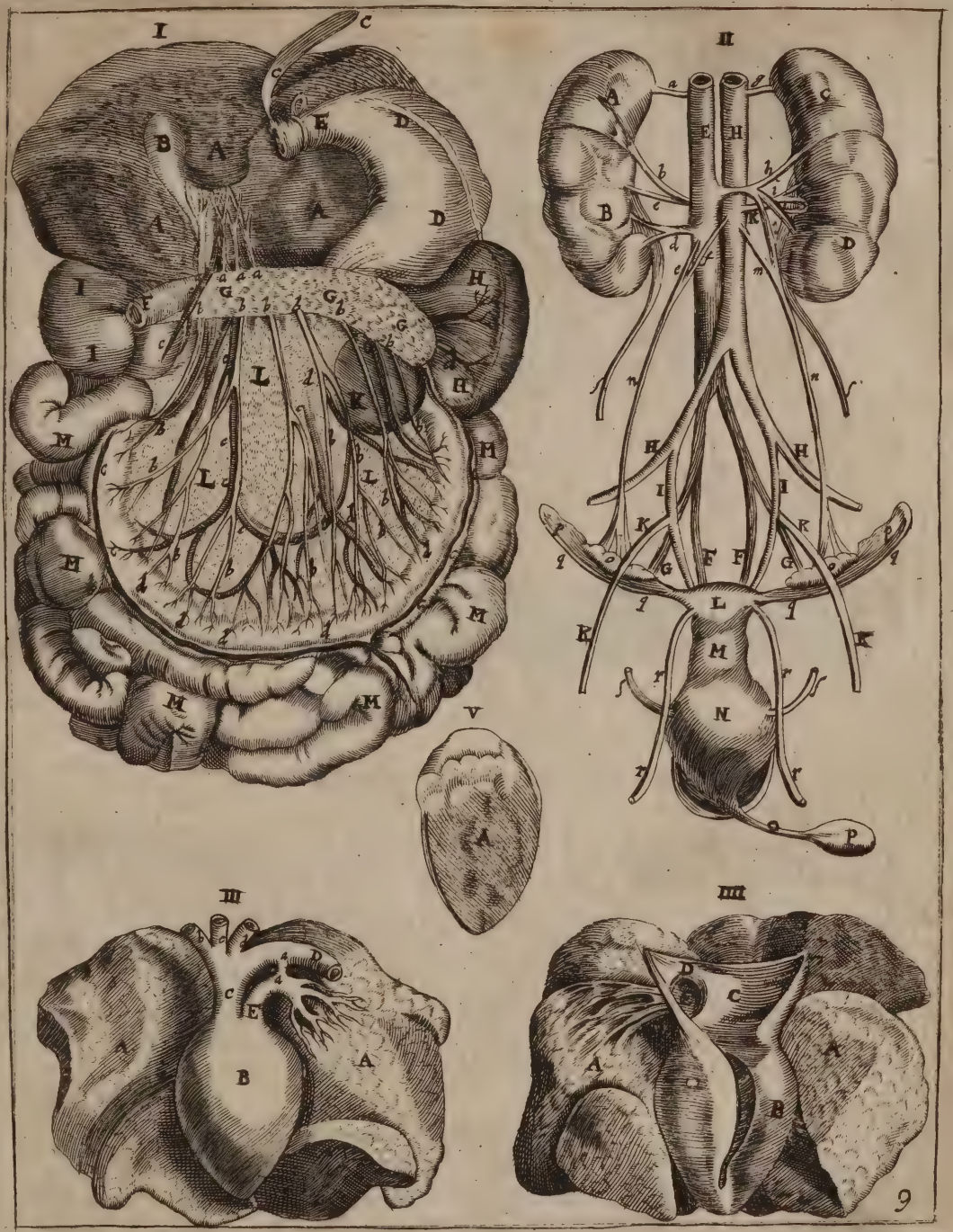
AA The Lungues diducted on both ſides.
B The Heart whol.
C The trunk of the great artery coming from the Heart.
D A portion of the ſame artery paſſing downwards.
E The Vena Arterioſa ſtretched from the Heart.
aa The channel between the Vena Arterioſa and the great Artery.
b The beginning of the right ſubclavian artery.
c The beginning of the right Carotides.
d The beginning of the left Artery Carotides.

FIG. IV.

AA The Lungues diducted.
B The Heart cut towards the right Ventricle.
C The Vena Cava opened neer the Heart.
D Anaſtomoſis between the Vena Cava and Arteria Venoſa.
E The ſhutter in the Anaſtomoſis.

FIG. V.

A The Corpus Thymium ſeparated from the Veſſels of the Heart.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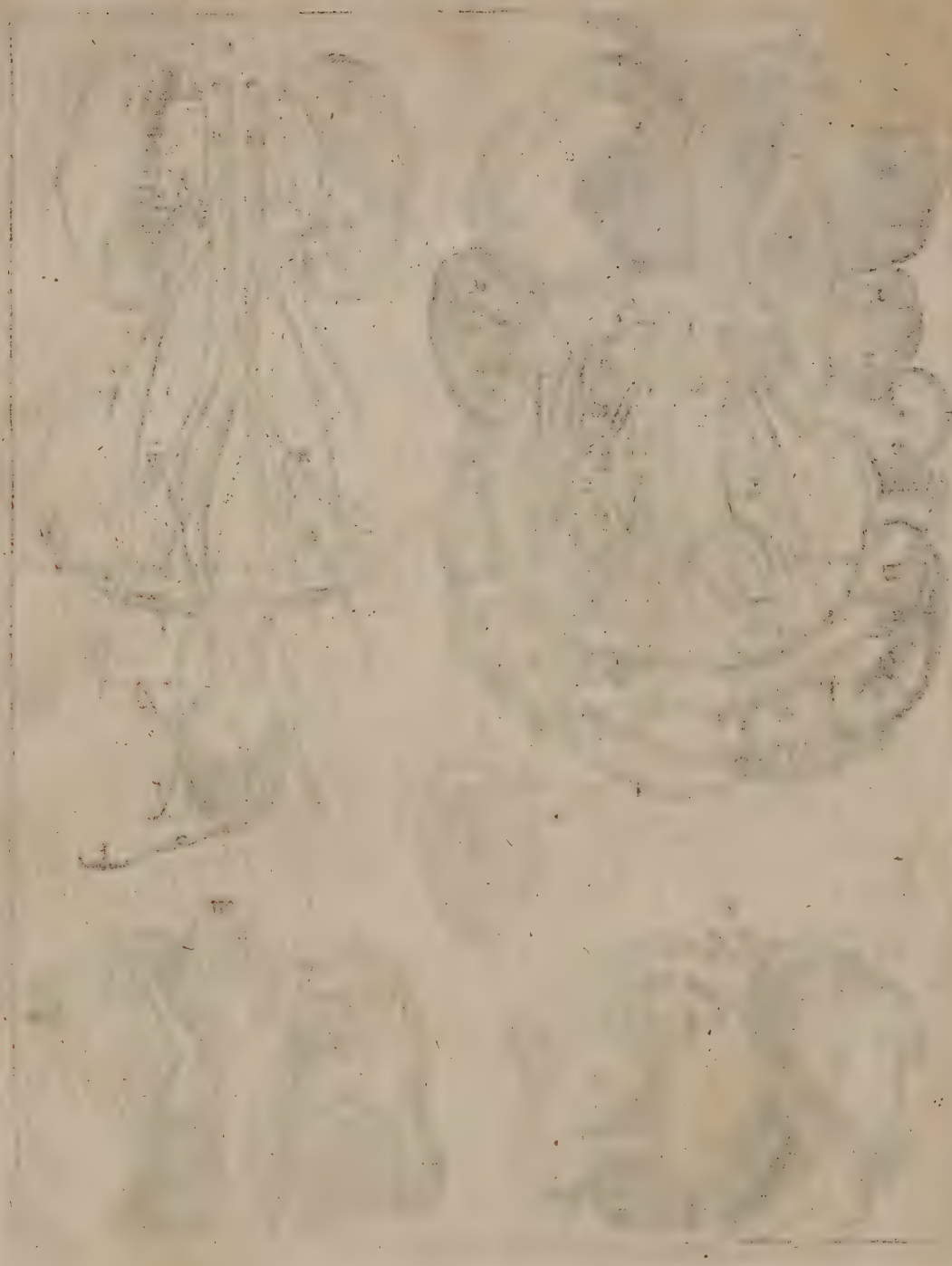

Back. The *Sternum* is divided into four parts, and sometimes into more; as also the *Os Ischium*, *Ilium*, and *Pubis*.

The extremity of the Bones which make the Wrest and Ancles are Cartilaginous, and obtain hardness strength, and perfection by age.

Place here the first and second Tables of the eighth Chapter, which hath the Number 8. and 9. at the corner of the brass Plates.

CHAP. 9.

Of the external parts of the Breast.

THE lower Ventricle, and the parts in and about it being already spoken of, the middle ventricle follows, which is called *Thorax*, in English the Breast, which is round about circumscribed with the *Pleura*; In which we will consider, First, the external parts, then the vitals themselves.

To the external parts of the Breast, belong the common coverings of the Body, of which we have spoken already; also the Pectoral Muscle, the *Serratus Anticus* both greater and lesser, and of Bones, the *Claviculæ* and *Scapulæ*.

The Pectoral Muscle is so called, because it is spread abroad the Breast and much encreaseth its bigness; its original is from the middle *Clavicula*, the *Sternum*, the Cartilages of the sixt, seventh, and eight Ribs, it hath a short, yet strong Tendon inserted into the Bone of the Shoulder between the Muscles *Deltois* and *Biceps*, and holds it stoutly to the Breast.

The Muscle called the greater *Serratus anticus*, ariseth obliquely to the Basis of the *Scapula*, from eight Ribs, five of the true ones, and three of the Bastard ones, and draws it down forwards. The lesser *Serratus anticus*, lies hid under the Pectoral, and proceeds from the second, third, fourth and fift Ribs, and passeth to the process of the *Scapula*, called *Ancyrois*, or Beak like, which moves the *Scapula* obliquely forwards; of the *Clavicula* and *Scapula* because they belong especially to the Shoulder, shall be treated of in the seventeenth Chapter.

And yet properly to the *Thorax* belong the Breasts, the Bones the Breast is composed of, the intercostal Muscles, the *Pleura*, the *Mediastinum*, and the *Diaphragma*.

The office of the Breasts in Women is to breed Milk, if you consider them in Women that give suck; they consist of very many small glandulous Bodies, diverse in bigness, that they may not only receive the Blood from the small Vessels, but also the vapors and milky moisture, which is largely distributed to them from the Stomach and Sweet-bread: by instinct of Nature, these small Bodies are contained together with a Membrane with diverse cavities which contain milk, the foundation of which remain when the milk is gone; they have much fat, which serves not only to ad comliness to them, but also to conserve vital heat in them.

They receive two veins, one derived from the axilliar branch wch is distributed by the external part of the Breast; the other is called *Mammaria* and is distributed by the internal part from the subclavian branch of the *Vena Cava*: they have also so many Arteries as veins arising from the same roots, namely from the Subclavian Branch of the great Arterie, and the axilliar, which are distributed in the same manner to give them vital heat; they have Nerves from the fourth Branch of the Marrow of the Back.

In the middest of the Breasts are the Nepples, round and rare, endewed with a Membrane from the glandulous Bodies; they have a thin skin full of holes, and stick out, that the Child may the better suck; round about them is a red circle like a *Halo*.

The bigness of the Breasts is varied, not only by years and their performing their office, but also by the humors that flow thither, and the diversity of the climate: In the Women in *Europe*, they are more contracted, but in the *Arabian* and *Indian* Women they are so long that they can give their Children suck over their shoulders: They are in number two, that so the woman may give two children suck; in temperament they are hot and moist, and are placed in the middest of the Breast, that so they may be the neerer to the Fountain of Vital Heat, and the readier to give the Child suck as the Mother carries it in her arms.

Their proper action is the Generation of Milk, although it be not yet very cleer by what waies it is done, because in Carkasses the passages are hid; as the passage of *Chyle* is in the *Mesenterium*, and of Seed from the Testicles to the *Parastatæ*, and from the *Prostatæ* to the *Urethra*, and other like passages in living Creatures, and yet the Dissection of living Creatures that give suck, gives some light to it.

For Bones, The Breast is defended with the *Sternum* before, on the sides with the Ribs, and behind with the *Vertebræ* of the Back; the substance of the Bones of the *Sternum* is spongy and red, usually divided into three parts, although in age it grow into one Bone; the first and largest of them, resembles the knob of a Cup, the other two are joyned to them by Cartilages; it hath a Cartilaginous apendix, which by reason of its form is called *Mucronata*; it is the defence of the *Diaphragma*, and sometimes

ſometimes gives paſſage to the Mammary Vein and Artery; this alſo in old age grows Bony, ſometimes it ſtick inwards and ſometims outwards, and that no ſmall prejudice to the Stomach; ſometimes it ſticks out towards the Navil as long as ones finger, and is ſtiff, and then it wonderfully hinders both the diſtribution of the *Chyle* by compreſſing the *Pylorus*, and alſo the bowing of the Body forwards.

The Ribs are partly Bony as on the Back and Sides, partly Cartiaginous as on the fore part where they are joyned to the *Sternum*; the one encreaſeth the ſtrength, the other makes the motion of the Breaſt the eaſier, and the Breaſt it ſelf the ſafer from external injuries; they are in number on each ſide twelve, of which, the ſeven ſuperior are called True, the other inferior, Baſterd Ribs, not becauſe they are ſhorter but becauſe they end not in the *Sternum* with Cartilages, for indeed nothing in our Bodies is ſpurious or falſe, but all formed by the hand of Almighty God.

They have a hollowneſs in the inferior part through which they give ſafe paſſage to the Veins, Arteries, and intercoſtal Nerves; all the Ribs are bowed in a circular form, that ſo they may give convenient largeneſs to the Breaſt; externally they are ſomewhat uneven, but internally where they are joyned to the *Pleura* they are very ſmooth, on the Back they are received by the holes of the *Vertebræ*, ſome of them have a ſingle, ſome a double knob; they are bound together with firm Ligaments, and are joyned to the *Sternum* before by Cartilages, and alſo they ſtick too on another, yet is not their nexure ſo firm, but external injuries often looſeth it, and in the Dropſie *Aſcites* the water often diſjoyn the Cartilages of the inferior Ribs.

As many Ribs as there are, ſo many *Vertebræ* are there to receive them, and twelve pair of Nerves from the Marrow of the Back proceed from them, the formation of *Vertebræ* is the ſame with thoſe of the Loyns, ſave only the Bones are more depreſſed.

The Muſcles of the Breaſt which cauſe the motion of it, are, the *Subclavia*, the triangular Muſcle, the Intercoſtals, and the Dorſals; of the Subclavian Muſcles is but one pair only, taking its beginning from the inferior part of the *Clavicula*, from whence it paſſeth to the firſt Rib and its ſuperiour part, which it moveth upwards and outwards.

The Triangular Muſcles are produced from the internal part of the *Sternum*, and ſtick to the Cartilages of the ſuperiour Ribs, which whilſt they contract, the Heart alſo moving it ſelf by their ſoftneſs, they keep it from being hurt by the *Sternum*. The Intercoſtal Muſcles on both ſides, are noted to be twenty two pair, of which, eleven are external, and as many internal, diſtinguiſhing themſelves by the obliquity of their ſtrings: The external Muſcles proceed from the inferior part of the ſuperior Ribs, and end in the ſuperior part of the inferior Rib, and therefore by drawing the Ribs, they further inſpiration: The internal intercoſtal Muſcle proceed from the ſuperior part of the inferior Rib, and end in the inferior part of the ſuperior, and by withdrawing the Ribs help the expiration; they receive veins from the Vein without a fellow, and

the ſuperior intercoſtal, Arteries from the ſuperior and inferior intercoſtals, Nerves from the Marrow of the back, from the eleven pair on each ſide, to which the internal branches of the ſixt pair joyn themſelves.

As for the Dorſal Muſcles, though they pertain to the Breaſt, yet are they better found out by diſſection when the Carkaſs is turned over upon its Belly; therefore we ſhal ſpeak of them in the following Chapter, yet to the containing parts of the Breaſt are to the referred: The *Pleura*, *Mediaſtinum*, and *Diaphragma*.

The *Pleura* is a Membrane girding the ribs, and their Muſcles, and incompaſſing all the internal parts of the Breaſt: It hath Veins, Arteries, and Nerves, from the intercoſtal branches, and about the *Vertebræ* of the back it is manifeſtly double, it is ſtrong every where, ſmooth next the Lungues, and firmly knit to the joynts of the back. The plenty of veſſels often cauſeth an inflamation in it, and corruption is often gathered there, and remains ſometimes between the ſides of the *Pleura*, ſometimes neer the Lungues, and ſometimes in the Cavity of the Breaſt, the Lungues being ſafe.

The *Mediaſtinum*, although it may be reckoned amongſt the internal parts of the Breaſt, yet ſeeing it appears to be only a continuation of the *Pleura*, we will deſcribe them together. It is a double Membrane ſtretched from the *Vertebræ* of the Breaſt to the *Sternum*, and diſtinguiſheth both Breaſt and Lungues, to the right and left part, bearing up both the Heart and *Pericardium*: It hath a proper Vein of its own, which is called *Mediaſtina*, which ariſeth from the ſubclavian branch of the *Vena Cava*, and it hath other ſmal branches from the Mammaries and Vein without a Mate; it hath Arteries from the Mammaries, and Nerves from the ſixt pair, eſpecially from its left recurrent branch.

The Largeneſs of the *Mediaſtinum* equals the longitude and depth of the Breaſt, its duplication under the *Sternum*, is evident, with an obſervable interval bteween, in which ſometimes a conflux of vicious humors, and ſometimes wind is gathered, and in deep Wounds, when the vitals themſelves are not hurt, they admit of a ſpeedy and eaſie cure: It is indifferent firm in reſpect of ſtrength, and ſoft towards the Lungues, and ſometimes hath fat on it.

The *Diaphragma* follow, otherwiſe called *Septum Tranſverſum*, which is placed between the Breaſt and the *Abdomen*, and gives bounds to both Cavities, and concurs with the external coſtal Muſcles to help inſpiration; It is framed of a double ſubſtance, for it hath a Muſculous fleſh and a double Membrane, the ſuperior of which it hath from the *Pleura*, and the inferior from the *Peritonæum*, and by their concourſe they fill up that part of it which wanteth fleſh; it hath Veins and Arteries from the *Vena Cava* and great Artery, which are joyned to it; It hath famous Nerves above from the plexure of the Nerves of the Neck, from the greater deſcending branch of the fifth pair, and this cauſeth the conſent between the *Diaphragma*, and the Head and Muſcles of the Lips.

On the right ſide the *Vena Cava*, and on the left ſide the *Gula* paſſeth through the *Diaphragma*: It is ſtretched out, firſt of all into two fleſhy;

Secondly,

A DECLARATION OF THE TABLE OF THE NINTH CHAPTER.

This Table represents the Muscles and bones of the Breast, its Membranes and *Diaphragma*.

FIG. I.

A *The Pectoral Muscle in his scituation.*
B *The same Muscle out of his scituation.*
C Serratus major anticus *in its scituation.*
D *The same a little removed out of it.*
E Serratus anticus minor *totally in its scituation.*
F *The subclavian Muscle in its scituation.*
f *The* Clavicula *bowed back under the pectoral Muscle.*
gg Platysma myodes *in the neck with their right strings.*
GG &c. *The external intercostal muscles without their scituation.*
HH &c. *The internal intercostal muscles in their scituation.*
II *A portion of the* Diaphragma *in its scituation.*
K *Part of the great artery descending.*
L *The hole for the* Gula *passing the* Diaphragma.
M *The hole for the* Vena Cava *descending.*
NN *The square muscles of the loyns in their scituation, of which Chap.* 12.
OO *The muscles called* Psoas *in their scituation, of which Chap.* 19.

FIG. II.

Shews the bones of the breast as they are to be seen forwards.

AA *The* Sternum.
B *The* Mucronata, *or sword-like Cartilage.*
CC &c. *The cartilaginous part of the Ribs.*
1.2.3.4.5.6.7. *The true Ribs.*
8.9.10.11.12. *The bastard Ribs.*

FIG. III.

Shews the Ribs, *Vertebræ* and processes on the back part.

FIG. IV.

The Breast opened, in which

AA *The* Mediastinum *drawn to the side.*
BB *The tunicle of the* Mediastinum *diducted under the* Sternum.
C *The right lobe of the Lungues.*

FIG. V.

AA *Part of the* Pleura *drawn at one side from the Ribs.*
BB *The Ribs laid bare from the* Pleura.
CC *The Ribs cloathed with the* Pleura.

FIG. VI.

Shews the *Diaphragma* separated from the Ribs and *Vertebræ*.

AAA *The fleshy part of the* Diaphragma *covered with its Membrane.*
BB *The Phrenical arteries.*
CC *The Phrenical veins.*
D *The passage of the* Vena Cava.
E *The passage of the* Gula.
FFF *The membranous part of the* Diaphragma.
G *The hole between the fleshy portions of the descending of the great artery.*

FIG. VII.

A *The left nerve of the* Diaphragma.
B *The right nerve of the same.*
C *The superior membrane of the* Diaphragma *separated.*
D *The fleshy substance of the* Diaphragma.
E *The hole for the* Gula.
F *The hole for the* Vena Cava.
GGG *The Membranous part.*
HHH *The fleshy parts between with the great artery descends.*


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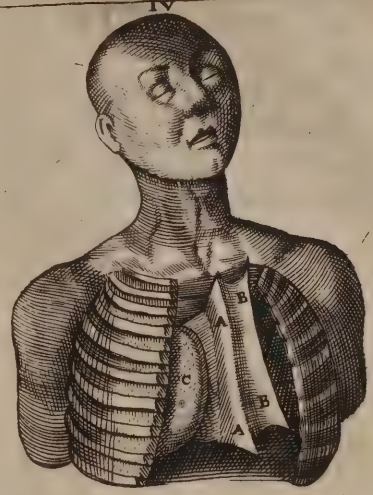
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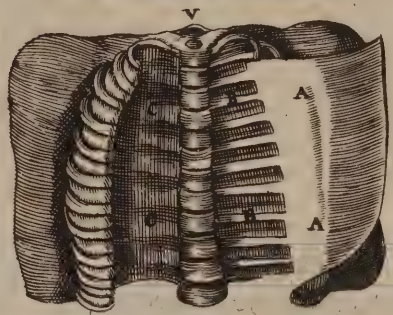
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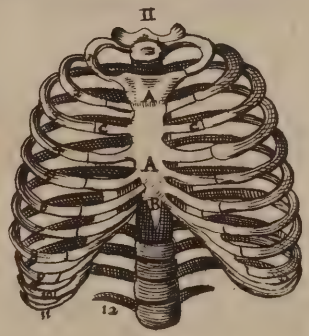
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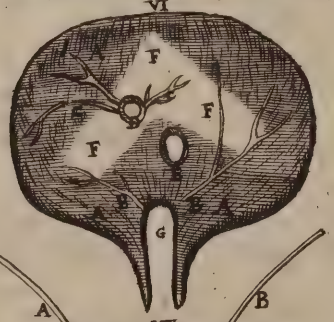
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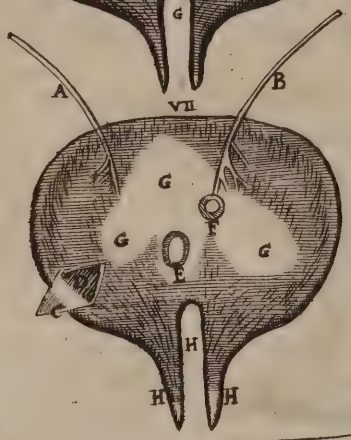
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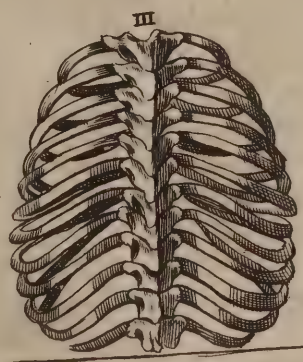
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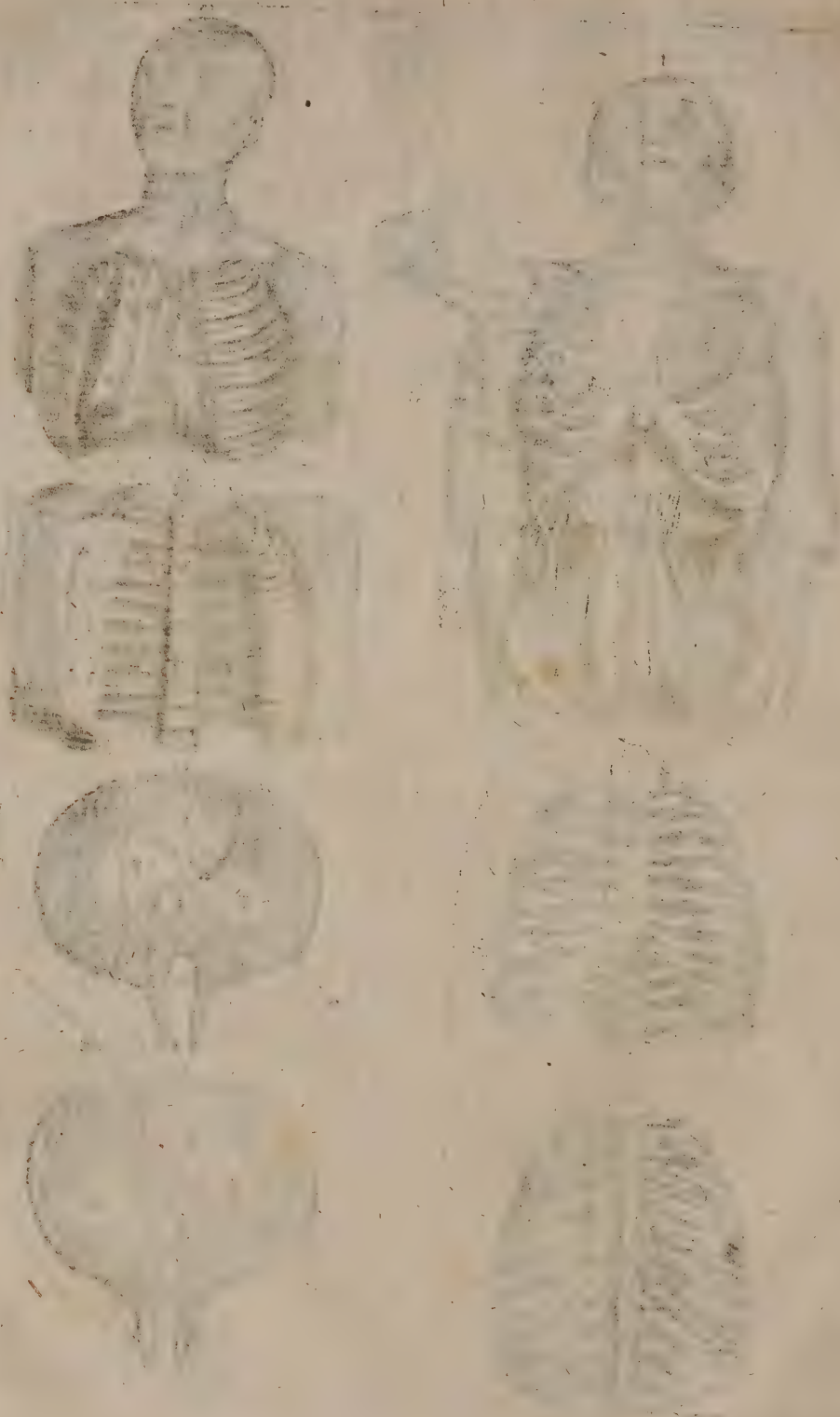

Secondly, into two tendinous proceſſes, by which the great Artery deſcends, the reſt of its form is almoſt circular, joyned to the *Vertebræ* of the Loyns, and the baſtard ribs: In the middle where it hath a Nervous centre, it is firmly joyned to the *Pericardium*, and ſometimes it knits to it ſelf the lobes of the Lungues which lye upon it, ſometimes it hath Apoſthumes in it, as big as ones fiſt, which by reaſon of their weight cauſe a moſt extream Difficulty of breathing.

Place here the Table of the ninth Chapter, which hath the Number 10. *at the corner of the braſs Plate.*

CHAP. 10.

Of the Heart and Lungues.

THE Heart and Lungues occupy the Cavity of the Breaſt, although the *Oeſophagus*, Wind-pipe, and common veſſels, have alſo their proper places in it.

Before we can behold the Heart, we muſt remove the *Pericardium* by which the Heart is wrapped round: It is of a Membranous ſubſtance, and not only contains the Heart in its proper place, but alſo defends it from injuries, neither is this Tunicle ſingle, but is obſerved to be outwardly the ſame with the *Mediaſtinum*, inwardly to proceed from the veſſels produced from the Heart: It hath ſmal Veins from the Phrenical, its Arteries are are ſcarce conſpicuous: It hath Nerves from the external, and internal branch of the ſixt pair, and its *Recurrens*; although the right branch of thoſe Nerves which are carried to the *Diaphragma*, paſſe by the out ſide of it, it is very neer the Heart, only there is that Interval between the Heart and it, which is commodious for the motion, and pulſation of the Heart; about the Baſis of the Heart where it is joyned to the *Mediaſtinum*, it gives paſſage to the Veins and Arteries; It contains in it a thin Liquor, gathered of reſolved vapors, whereby the drineſs, and ſuddain heavineſs of the Heart is allaied.

The Heart it ſelf, which is the Prince of all the Bowels, and the Fountain

Fountain of vital heat and Spirit, by whose flourishing the Creature flourisheth, and by whose languishing it languisheth, and by whose failing it dies. I call it the Fountain not of that primoginial heat produced by the substance of the Seed, but of the influential heat; which is taken from nourishment, or drawn by Blood; It consists of a thick and compact substance, that it may not only keep that hot and vital Spirit to its self, but also communicate to the whole Body by the Arteries: It hath a proper Membrane of its own, which is very thin, and yet very strong.

The coronal Vein and Artery are distributed about the exterior part of it, the Vein from the *Vena Cava*, which by a Moon-like shutter stops the Blood running back; the Artery from the great Artery, which gives his branches most especially to the left side of the Heart, it hath Nerves from the next branches of the sixt pair, which are distributed to the fleshy substance of the Heart, and are scarce observable to any, of those which come to the *Pericardium* we have spoken before, of which, that which proceeds from the left *Recurrens* gives a branch to the Basis of the Heart, neither can the Heart want these, for its motion sake, because it moves before the animal faculty gives either Sence or motion: It hath very many Spermatical parts, according to the recess of its Cavities, like Nerves in form, but larger, and if you dilligently view them in a Dissection, you shall find they have a pore within. The greater part of the Heart is covered with fat, which preserves it from consuming, which sometimes is so copious, that the blind South-sayers that judged by the entrails of beasts, said they had no Hearts, because they could not see them for fat.

There hang appendices neer the Basis of the Heart, on each side, and by reason of their likeness they call Eears, and their substance is almost like; Save only that the left is a little more solid, they are both of them hollow, and full of Nervous strings; yet the Heart being contracted *Systole*, it may receive the Blood flowing into it, and return it back again; the bigness of the Heart in Man is famous, though various according to age and Temperament.

It is divided into the Basis, or broadest part, and the top; which is the narrowest, and ends in a poynt: It hath two Ventricles, the right, and the left, the right is the thinner, but the larger, distinguished by a thin and fleshy portition, which sometimes being doubled, makes a third.

From the right Ventricle, the *Vena Cava* takes its original, whose beginning is strong, being Membranous with shutters at the end, that it may administer Blood to the Heart to perfect. I call it a vessel, because it contains a liquid substance, to be distribnted to all the parts of the Body, and a Membranous vessel, on it consists of its own proper Tunicle, which is single and soft, that it may the better draw the blood by inosculations, and yet for safeguard in its progresse, where it lies more open; it is covered with the covering of the adjacent parts.

Also the Provident Creator hath added shutters to it, to wit, very thin

thin Membranes, in form like a half Moon, which looks towards the beginnings of the Veins, which set a moderation to the preternatural motion of the Blood, out of the great Veins into the less; these although they may be seen in the Mesenterick, Splenical emulgent *Azygus*, and jugular Veins, yet are they more freequent in the Veins of the Limbs, which we shall treat of in the last Chapter; from these the three shutters about the mouth of the *Vena Cava*, differ a little in form, and from their form Authors call them *Tricuspides*; these are joyned to the Nervous strings of the Heart, and withstand the regresse of the Blood into the *Vena Cava*.

The *Vena Cava* arising up above the Heart produceth the *Azygus*, or Vein without a fellow, the branches of which, are commonly distributed to the inferior Ribs; the inferior portion of this, descending neer the fleshy portion of the *Diaphragma*, is inserted again on the left to the Emulgent, on the right side to the *Vena Cava*, and to the first of the Loyns, the Institution of Nature being varions herein, which sometimes the *Azygus* bei ng let passe, produceth a famous Vein from both Subclavian branches of the *Vena Cava*, neer the Mammaries, which is stretched out all along the Breast, even to the *Os Sacrum*, from which both all the intercostal Veins, and the Lumbals proceed: when the *Vena Cava* arives at the Throat, it is divided into two large branches, called Subclavian, from which the superior intercostal, the internal Mammary, the *Mediastina*, the cervical, and Vein called *Muscula* arise; above, the interior and exterior jugular, and the superior *Muscula* are produced.

Also from the right Ventricle of the Heart ariseth a vein, which for its double Tunicle is called *Arteriosa*, which being distributed both to the right, and left part of the Lungues, by great branches administers Blood freely to them; about the bnginning of it are three Membranous shutters, very conspicuous, looking outwards, called *Sigmoides* from their form, they shut in the Blood which flows back from the compressure of the Lungues, but is indeed an Artery, not a Vein, for besides the substance of an Artery which it hath, it hath also pulsation as well as the rest of the Arteries, as the Dissection of Creatures alive shews, and it carries Blood already attenuated by the Heart.

The left Ventricle of the Heart, is smaller than the right, but more fleshy, whereby it stirs up the Spirit in the received Blood, both by its self, and by its stronger motion, and this is called vital.

The great Artery called *Aorta*, takes its beginning from this; a Membranous vessel in continual pulsation while life remains, of a shining colour, and distributes the Blood being absolutely perfected in the Heart, to the whole Body: Its substance is more Nervous than a vein, and covered with a double Tunicle, of which, the internal is the thicker, and is sometimes stiffe in old age, so that in, and neer the Heart it represents a Bony circle; the external is thin, to which the Membranes of the adjoyning parts ad strength.

At its beginning are three shutters conspicuous, and are called *Lunar* from their Figure, and keep the Blood from returning back again into

the Heart, neither is there any other ſhutters in all its Progreſs, for the ſtrength of the internal tunicle doth not eaſily ſuffer dilation; and beſides, there is no delay in the paſſage of blood in it: Its blood is hotter, fuller of ſpirits, and of a brighter colour, and ſeeing the diſtribution of it by pulſe is continual, the heart muſt needs be continually ſupplied by the *Vena Cava* to fill its Ventricles, and this cauſeth a perpetual motion of Blood to the Heart, more or leſs; for the very ſame end Nature hath placed the veins as companions to the arteries, that they might readily receive what might be adminiſtred to the emptying of the Heart, for the exact knowledg of which our age is beholding to *William Harvey*.

The deſcending Trunk of the great Artery as it diſtributes the inferior intercoſtal Arteries, the Phrenical and others which we diſcourſed of when we treated of the *Abdomen*; ſo paſſing out of the Heart it is divided into two large ſubclavian branches, from which, before they paſs out of the Breaſt, ariſeth below, the ſuperior intercoſtal Artery, and a little higher the interior Mammary, the Vertebral and Cervical; the remainder of the great Artery produceth the *Carotides* on both ſides, the internal and external branch of which riſe up to the head.

Neer to thoſe Veſſels about the Throat are the *Thymus*, a ſoft and ſpongy piece of fleſh, which underproppeth them for their ſafe-guard.

From the left Ventricle of the Heart, proceeds an Artery which the Ancients call *Venoſa* becauſe it hath but one Tunicle and dividing its branches, it is carried to the right and left region of the Lungues, taking the Blood mixed with Air to its ſelf, and carrying it to the left Ventricle of the Heart. It hath two ſhutters to ſtay the blood from flowing back from the Heart into it, which Authors call *Mitræ* becauſe they are like a Cardinals Cap; but this veſſel is rather to be called a Vein than an Artery, becauſe its ſubſtance is the ſame with the Veins, neither hath it pulſe as Arteries have, it carries the Blood tempered with Air to the Heart.

Between the Ventricles of the Heart is a partition called *Septum*, which is hollowiſh toward the left ſide, but gibbous towards the right, having very many ſmall holes; many paſſages come to this ſame *Septum*, of a various bigneſs from the *Vena Cava* and the *Arteria Venoſa*, which cloath the Baſis of the Ventricles, and adminiſter neceſſary Blood unto them.

In temperature the Heart is without doubt the hotteſt of all the Bowels; its Baſis is in the middeſt of the Breaſt, only the top of it inclines towards the left ſide as it moves; it is joyned to the next parts by its Veſſels, and by the *Pericardium* to the *Mediaſtinum* and *Diaphragma*.

Its proper action is to perfect the Blood, and to give it heat and vital ſpirit, and motion which is called *Pulſe*; this is diſtinguiſhed into *Syſtole*, when the Heart drawing its ſelf together expels the Blood, and *Diaſtole* when it extends its ſelf to receive it.

According to the opinion of the Ancients, only the Heart conſumes not in laſting diſeaſes, and yet it often happens that it doth pine by reaſon of hot diſtempers; ſometimes a glandulous ſubſtance makes its

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paſſages ſtraight, and ſometimes they are filled with Flegm, whereby the ſick loſeth his life leiſurely and by degrees.

On both ſides of the Heart are the Lungues, which are diſſimilar parts of the middle Ventricle and by drawing in the cold air, and returning back the fuligincus vapors they cool the vital heat, therefore that they may every where be filled and diſtended, they are compoſed of a ſoft ſubſtance rare and ſubtil, and covered with a porous Membrane; they receive very large veſſels, the Arterial vein from the right, and the Venal artery from the left Ventricle of the Heart: alſo the wind-pipe which we ſhall diſcourſe of in the next Chapter, it hath ſmall Nerves from the external deſcending branch of the ſixt pair, but diſperſed about the exterior Tunicle, and the hinder parts of it, where they are joyned to the branches of the Wind-pipe; not only for their ſafety, but alſo for the means of its ſence, that it may not be troubleſom to their motion.

The Lungues being ſwelled by inſpiration of air, fill the Breaſt univerſally, and the *Mediaſtinum* being between they are divided into the right and left part, both which for the more ſafeguard is divided into the ſuperior and inferior lobe; outwardly, the Lobes reſemble an Ox-hoof; inwardly they are hollowiſh, and gently imbrace the Heart, and therefore often communicate their vices to it, although if putrified matter lie in the gibbous part without any evident rottenneſs, or feaveriſh burning; the ſtrength of the Heart and the vigor of the Natural functions remains long untouched.

They are judged to be in temperature hot and dry, by reaſon of the plenty of ſpirits, and ſcarcity of nouriſhment although the moiſture that alwaies flow to them and the frequent acceſs of cold Air ſeems to obſcure both, they are thicker in Children, and grow rare by degrees, and alſo change colour, for in old age they are limber and whitiſh, they are joyned to the Neck by the Wind-pipe to the back and *Sternum* by the *Mediaſtinum* to the *Pleura* and *Mediaſtinum* by the skin that compaſſeth them ſometimes, and ſometimes by ſome fibrous nexures. The action of the Lungues is reſpiration, which they are moved to by the copious flowing of hot blood to them, by the Arterious vein; the ſame is done by the Muſcles, breaſt and Lungues dilating and contracting themſelves in the Breaſt.

Place here the Table of the tenth Chapter, which hath the Number 11. *at the corner of the braſs Plate.*

CHAP. II.

Of the Organs of Voyce and Speech.

THE Wind-pipe called *Trachæa* and *Aſpera Arteria* conduceth much to the perfecting of the Office of the Lungues, being the channel by which we draw air by inſpiration, and by expiration caſt out fuliginous vapors, and form voice and ſpeech: Its ſubſtance is partly Cartilaginous, that the voyce might be the eaſier, by reaſon of the drineſs of the Organ, and partly Membranous where it is joyned to the *Oeſophagus*, that the dilation of it might not be hindred by lying upon a hard body. The Cartilaginous part is not all one, but compoſed of very many rings, of which the ſuperior are the greater; thoſe which are next the *Gula*, want the inferior part of their circumference, the reſt remain whol till after they have entred the ſubſtance of the Lungues, they are all curiouſly knit together, by a fleſhy Ligament, at laſt they end in Membranous channels like Arteries.

The Wind-pipe is covered with a double Membrane, one external which they hold it hath from the *Pleura*, which is thin and firmly bound to the Ligaments of the Cartilages, the internal is thicker and common to the pallat of the mouth, of exquiſite ſence, and ready to caſt out what troubles it, it is bedewed with a fatty humor, that the ſound may be the cleerer, for being rough with flegm, the voice is hoarce, if dried with heat, it is not ſteady, [*Clangoſus* is when the voyce begins grave, and ends acute.]

It hath veins from the external Jugular, Arteries from the *Cartides*, Nerves from the external branches of the ſixt pair, & its *Recurrens*: Sex & difference of Temperament alters the bigneſs of the wind-pipe; in form it is like a ſmall ſhrub that hath crooked branches every way, neither is it joyned to the Lungues only, but alſo to the *Oeſophagus*, and by its head to the *Os Hyois*.

It is divided into two parts, *Bronchus* and *Larinx*, that which is called *Bronchus* is the lower part, long, and divided into many branches in both ſides of the Lungues: The *Larynx* is the ſuperior part or head of it, formed of Cartilages and Muſcles, for the forming and expreſſing of ſounds.

Its Cartilages are five, whereof the firſt is called *Thyroides* or buckler-like, from its form, being hollow within and gibbous without, which is that which ſticketh out in the Throat of ſome men: Its proceſſes are four, of which, two which are ſuperiour, and the longer are joyned below to the ſides of the *Os Hyois*; the other two which are the inferior and ſhorter, are joyned to the ring-like Cartilage.

The Buckler-like Cartilage is moved by three pair of Muſcles, of which, the

the first which draws the Cartilage downward, proceeds from the superior and internal part of the *Sternum*, and is inserted into the inferior side of the Cartilage, it is called *Sternothryroides* by the Ancient.

The second pair which are very small, move the Cartilage in the same manner, but something obliquely; they take their origional forewards from the Ring-like Cartilage, and end in the inferior side of the Buckler-like Cartilage, from whence they obtained the name *Crycothyroides*, though sometimes on the sides they are largely divided into two Muscles; by both these pairs the chink of the *Larynx* is not a little dilated: to draw the buckler-like Cartilage upwards, and bind together the chink of the *Larynx*, is the third pair ordained, which ariseth from the inferior side of the *Hyois*, and ends about the inferior part of the Bucker-like Cartilage, and is called *Hyothyroides*.

The second Cartilage is called *Cricoides*, or ring-like, because before 'tis round, behind hath a broad back, just like the Ring the Turkish Archers use to fight in (I doubt my Author was mistaken, it was the Parthian horse-men, not the Turks, that used to fight in Rings.)

The third and fourth Cartilages, are called *Arytænoides*, because their form makes a lip like a Laver, and they represent that part of the *Larynx* which is called *Glottis*.

Both of them for the better framing of the voyce, are moved with four pair of Muscles; of which, the first are called *Thyroarytænoides*: It ariseth from the middle internal part of the *Thyrois*, or buckler-like Cartilage, it is fleshy, and raised upwards and forwards, into the sides of the *Arytænois*, and binds in the chink of the *Larynx*. The second pair are called *Arytenoides*, they are very small, yet fleshy, and arise from the *Arytenois*, in what part it is joyned to the Ring-like Cartilage, it ends in the *Arytenois*; the extremities of them so meeting together, that they seem to be but one Muscle; by this pair whilst the Basis of the *Arytenois*, is obliquely moved, and drawn together, the chink also of the *Larynx* is shut. The third pair is called *Cricoarytenoides posticum*, for they arise from the *Cricois*, or Ring-like Cartilage, from its broad back, and are inserted below into the *Aritænois*, by a short and Nervous tendon, which whilst they move backwards, and outwards, they open the passage of the *Larynx*. The fourth pair is called *Cricoarytænoides Lateralis*, because they arise from the back side of the Ring-like Cartilage, and end in the *Arytænois*, and dilate the passage of the *Larynx*.

The fifth Cartilage is called *Epiglottis*, or that which covers the Chink, least the meat and drink should passe down the Wind-pipe, and yet it shuts not so close, but thin humors which passe down gently may passe that way: It is softer than the rest of the Cartilages, and in form is like an Ivy leafe; the larger the *Larynx* is, the larger is the *Glottis*, and as that is larger, so the Voyce is stronge and graver: The lesser, dryer, and narrower the *Larynx* is, the weaker, and shriller is the Voyce.

The *Os Hyoides*, called also *Tpsiloides*, is placed about the Basis of the Tongue, both for its safeguard, and also for its motion, it consists of three Bones, which being joyned together, represent the form

of the Greek letter *Upſilon*, of theſe the middlemoſt is largeſt, broad, and ſomething hollow, to which the other are joyned like Horn; many Cartilaginous appendices are joyned to theſe, which ſometimes alſo grow Bony, of which two are very freequent, in form and bigneſs like a grain of Wheat, and placed about the middle Bone, which is called the Baſis of the *Hyois*; two others ſtick to the lateral Bones, which are called Horns, and are knit to that Nervous Ligament of the Bodkin-like apendix, in what form they are often ſeen in the Body of Man, the eleventh and twelth Figure of the following Table will declare.

The *Os Hyois*, is removed by five pair of Muſcles, of theſe that which moveth it down right ariſeth, from the top of the *Sternum*, and aſcends to the Baſis of the *Hyois*, and is called *Sterno Hyoides*; another pair moves it obliquely downwards, which ariſeth from the ſuperior ſide of the *Scapula*, beſides the proceſſe called *Coracois*, and conſiſting of a Nervous Body, is carried to the ſides of the *Os Hyois*, and is called *Coraco Hyoides*: The third pair, which draws it obliquely upwards, ariſeth from the extremity of the Bodkin-like apendix, with a round Body, and is ſtretched to the Horns of the *Hyois*, and is called *Stylocerato Hyoides*: The fourth pair which draws it directly upwards, ariſeth from the internal, and lower part of the Chin, and paſſeth to the Bones of the *Hyois*, and is called *Geniohyoides*; to theſe we add a fift pair, which are commonly attributed to the tongue, and are called *Geniogloſſum*, which ariſe inwardly from the Chin, under the former, and end in the Baſis of the *Hyois*, drawing it upwards; although in reſpect of the former, they might more rightly be called the internal *Geniohyoides*. The *Os Hyois*, is joyned to the Bodkin-like apendix, and to the Buckler-like Cartilage; eſpecially to the Tongue, for the reaſons mentioned before, and receives the *Epiglottis* in its Cavity.

Alſo the Tongue is the framer of Speech, and a great help to the ſwallowing of the Meat, and preparing it for the Stomach: It is of a fleſhy ſubſtance, ſoft, and rare, covered with a thin Skin, and full of pores; It hath two veins from the external Jugulars, which are called *Raninæ*, and as many Arteries from the *Carotides*; It hath two pair of Nerves, of which, the ſmalleſt comes from the fourth conjugalation, and is carried to the exterior part of the Tongue; but the greater which goes to the interior part of it, comes from the ſeventh conjugalation.

The Tongue is moved both by the Muſcles of the *Hyois*, and alſo by its own proper Muſcles, which are four pair; the firſt which is genuin to the Tongue, lifts it up, and ariſeth from the Bodkin-like apendix, and is inſerted about the middle of it, and called *Styloglosſus*; another pair ariſeth from the Baſis of the *Os Hyois*, and depreſſeth the Tongue, this alſo ends about the middle of the Tongue, and is called *Baſioglosſus*: The third pair moves the Tongue to the Sides, and ariſe from the Horns of the *Hyois*, and is joyned to the ſides of the Tongue, and for that cauſe called *Ceratoglosſus*; to theſe are added a fourth pair of Muſcles, ariſing from the hinder grinders, and are called *Myloglosſus*, this is not immediatly inſerted into the Tongue, but into its Ligament, and is ſuppoſed to turn the Tongue upward. The

The Tongue of man hath a mean habit divided upon a Line along the length of it: In respect of the harmony of manifest quallities it is temperate: If it be colder or moister, it is by accident; It is joyned to the parts under it by a strong and Membranous Ligament, the extremity of which makes a bridle, the rest of it is joyned to the *Os Hyois*, and *Larinx*.

At the root of the Tongue are two *Glandula*, which the Greeks call *Antiades*, and *Paristhmia*, but the Latins *Tonsillæ*; a fleshy and loose substance compasseth them about from the pallat, which as it receiveth them in its Cavity, so it takes a moist excrement from them: There are other *Glandulæ* under the Chin, between the *Hyois*, and the Muscles of the Tongue; as also behind, which are called *Parotides*, the common use of them, is to receive the superfluous moisture, and to moisten the parts adjacent to them.

Neer the *Epiglottis*, from the extremity of the pallat, is a Pendulous, Fungous, Red piece of flesh produced, which Authors call *Gargareon* and *Uvula*: It is moved by two pair of Muscles, of which, the external takes its original from the top of the Wedge-like Bone, neer the joynt of the *Maxilla*, and passing with his tendon by the Chink of that Bone, it is inserted into the sides of the *Gargareon*, which moves it forwards when the Tongue is depressed, the other or internal pair, begins a little higher, from the top of the Bone of the Temples, which looks to the internal wing of the Wedge-like Bone, and descends with a fleshy and round Body, into the middle of the *Uvula*, both of hem conduce to the easy descending of the nourishment, the pleasantness of the Voyce, and the preparation of the air which is drawn into the Breast.

Moreover the Neck is an apendix to the middle Ventricle, and is long for the better ordering the Voyce; the hinder part of which, is called *Cervix*, it hath both the common coverings of the Body, and vessels, as Veins, Arteries, and Nerves; also *Vertebræ*, and] Muscles of its own.

Its *Vertebræ* are seven, of which the *Spinæ Bifidæ*, and the transverse processes have holes through them for the Ascending of the Vertebral Artery: The first is called *Atlas*, thin in substance, and without a *Spina*, which holds up the Head, like the *Olympus* of the Body, to which it is knit with a strong Ligament; It is larger in Lyons, and the like beasts of prey, and hath transverse processes like wings, which adds not only strength, but also some stiffeness to the Neck, which the Ancients fallsly attributed to the several Bones: In the Cavity of this the second *Vertebræ* is received, which for its turning, is called *Epistropheus*, it sends out a round processe, and long like a Tooth, from whence *Hippocrates* gave it the name *Vertebræ*, the head and first *Vertebræ* are turned about this, it is both knit to the hinder part of the Head, and compassed about with a strong Ligament: The third is called *Axon* by the Ancients, the rest have no distinct names.

The Neck is moved by four pair of Muscles, of which, two bow it, and the other extend it; the first that bows it, is called *Longus*, which arising

ariſing under the *Oeſophagus* from the fifth *Vertebræ* of the Breaſt is knit to the firſt *Vertebræ* of the Neck; to this long Muſcle is a ſhort one adjoyned for its ſhortneſs called *Brevius*, ariſing from the tranſverſe proceſſes of the inferior *Vertebræ* of the Neck to the Baſis of the Head, and therefore together with the pair called *Maſtois*, bows not the Neck, but the Head. The ſecond pair for its form ſake is called *Scalenum*, which ariſeth from the firſt Rib of the Breaſt, with a broad and fleſhy beginning, and growing ſlenderer by degrees, paſſeth by its oblique *fibræ* to the tranſverſe proceſſes of the *Vertebræ* of the Neck: the third and fourth pair we ſhall deſcribe in the following Chapter amongſt thoſe Muſcles that extend the Head.

Place here the Table of the eleventh Chapter, which hath the Number 12. *at the corner of the braſs Plate.*

CHAP. 12.

Of the Muſcles of the Scapula, *Back, and certain of the Head.*

VEry many Muſcles occupy the Back, of which ſome are proper to it, and ſome move the parts neer it.

The firſt in order of diſſection are the two Muſcles called *Trapezii* and *Culcullares* becauſe being joyned together they reſemble a Fryars Cool, they move the *Sapula*; they begin at the hinder part of the Head, and the hinder proceſſes of the *Vertebræ* of the Neck, being joyned by a Membranous nexure to the eight ſuperior *Vertebræ* of the Back; from hence being knit together by degrees, they end in part of the *Clavicula*, on the top of the ſhoulder, and eſpecially in the *Spina* of the *Scapula* and the Baſis of it; neither is their motion ſimple, their Original having ſuch latitude, for by reaſon of the diverſity of their *fibræ*, they move the ſhoulder backwards as well as obliquely upwards or downwards.

Under

A DECLARATION OF THE SECOND TABLE OF THE TENTH CHAPTER.

In this Table, the Trunks of the *Vena Cava* and great Artery as they pass from the Heart are represented; with their chief branches only produced even to the Limbs.

FIG. I.

Shews the *Vena Cava*.

A The beginning of the Vena Cava, with his large orifice about the Heart.
BB The rise of the subclavian branches.
C The beginning of the descending trunk.
DD The right and left Iliack branches.
aaa &c. The branches of the Azygus distributed to the Ribs.
bb The superior intercostal.
cc The internal mammary.
* The Mediastina.
dd The Vertebral Vein.
ee The internal Jugular cut off under the skul.
ff The external Jugular, from which the inferior branch riseth to the Organ of speech, and the Subcutaneus by the face and Temples, and backwards by another branch to the Ears.
gg The Cervical Vein.
hh The progress of the subclavian branches.
ii The internal scapular vein.
KK The external scapulars.
3 3 The vein carried to the Muscle Deltois.
ll The superior Breast-vein.
m m The Cephalick vein cut off.
n n The basilick vein cut off.
o o The inferior Breast-vein.
p The left phrenical vein.
q The right phrenical vein.
rr A famous branch distributed in the Liver.
ss tt &c. The sprigs thereof distributed in the right and left side thereof.
u u The Venæ musculæ, or superior Lumbals.
y y The veins of the Renal Glandulæ.
xx The right and left emulgent.
ϰϰ The right and left spermatical.
αα The beginning of the Lumbals.
ββ The Vena musculæ of the inferior Lumbal.
γγ The Vena sacra.
ΔΔ The external Iliack branch.
EE The Epigastrick vein.
ϛϛ The internal Iliack branch.
ϛϛ Vena Glutea.
ζζ The Hypogastrick veins.
ηη The veins of the Privities.
θθ The inguinal veins.
KK &c. The branch of the crural vein.
iii The Saphena.
λλ The vein Ischias.

FIG. II.

Particularly describes the coronal vein of the heart.

FIG. III.

Shew the Arterial Vein of the Heart.

A The beginning by which it passeth out of the right ventricle.
BB Its branches which pass to the right part of the Lungues.
CC Its branches which pass to the left.

FIG. IV.

Shews the great Artery.

A Its beginning rising out of the heart.
BB The beginning and progress of the subclavian branches.
C The trunk descending.
DD The right and left Iliack branches.
aa The artery Carotis.
bb Its external branch distributed to the Jaws, Face, and backwards to the Ears.
cc The internal Carotis cut off under the skull.
dd The vertebral artery in like manner cut off.
ϛϛ The cervical muscula.
ee The internal Mammary.
ff The branches of the superior intercostal artery.
gg The internal scapular artery.
hh The external scapular artery.
ii The superior breast-artery.
kk The inferior breast-artery.
l m The arteries distributed to the muscles of the Shoulder.
n n The inferior intercostals.
o o The phrenical arteries.
p The famous artery called Cœliaca.
q Its right branch divided into three parts; of which, the superior and inferior is distributed to the Liver, and the middle to the Gall.
r The left branch of the Cœliacal.
s The right Gastrical artery.
t The splenical artery divided in smal branches to the spleen.
u The artery called Epiploica.
ur The Gastroepiploica.
x The artery carried to the Renal Glandula.
yyy &c. The superior Mesenterical artery distributed into branches.
ϰϰ The emulgent arteries.
αα The rise of the Lumbal arteries.
ββ The spermatical arteries.
γγ The inferior Mesenterical artery derived into many branches.
ϭ The Arteria sacra.
ΔΔ The external Iliack artery.
ϛϛ The internal Iliack.
ηη Arteria Glutæa.
ζζ The Hypogastrick artery distributed to the right Gut and Privities.
♀♀ The Hypogastrick artery distributed to the womb distinguished from the former.
ϛϛ The umbilical artery.
EE The Epigastrick artery.
θθ The Arteria Pudenda.
ii The Ischias.
kk The inferior Arteria Muscula.
λλ The artery which goes to the internal Iliack muscle.

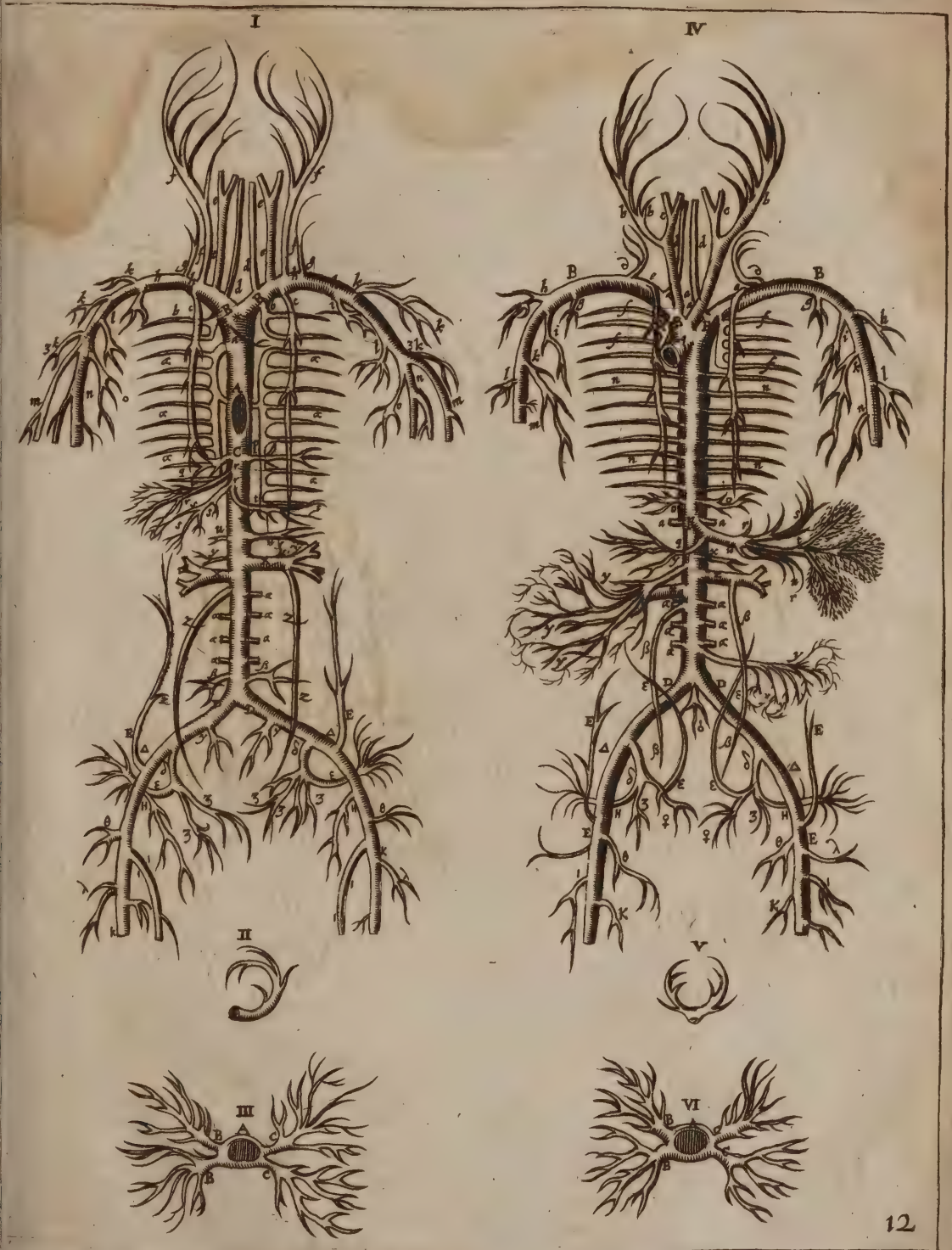
FIG. V.

Shews the Coronal Artery of the Heart.

FIG. VI.

Shews the Venal Artery arising from the left Ventricle of the Heart.

A Its Orifice.
BB Its branches distributed to the right side of the Lungues.
CC Its branches distributed to the left.


I
IV
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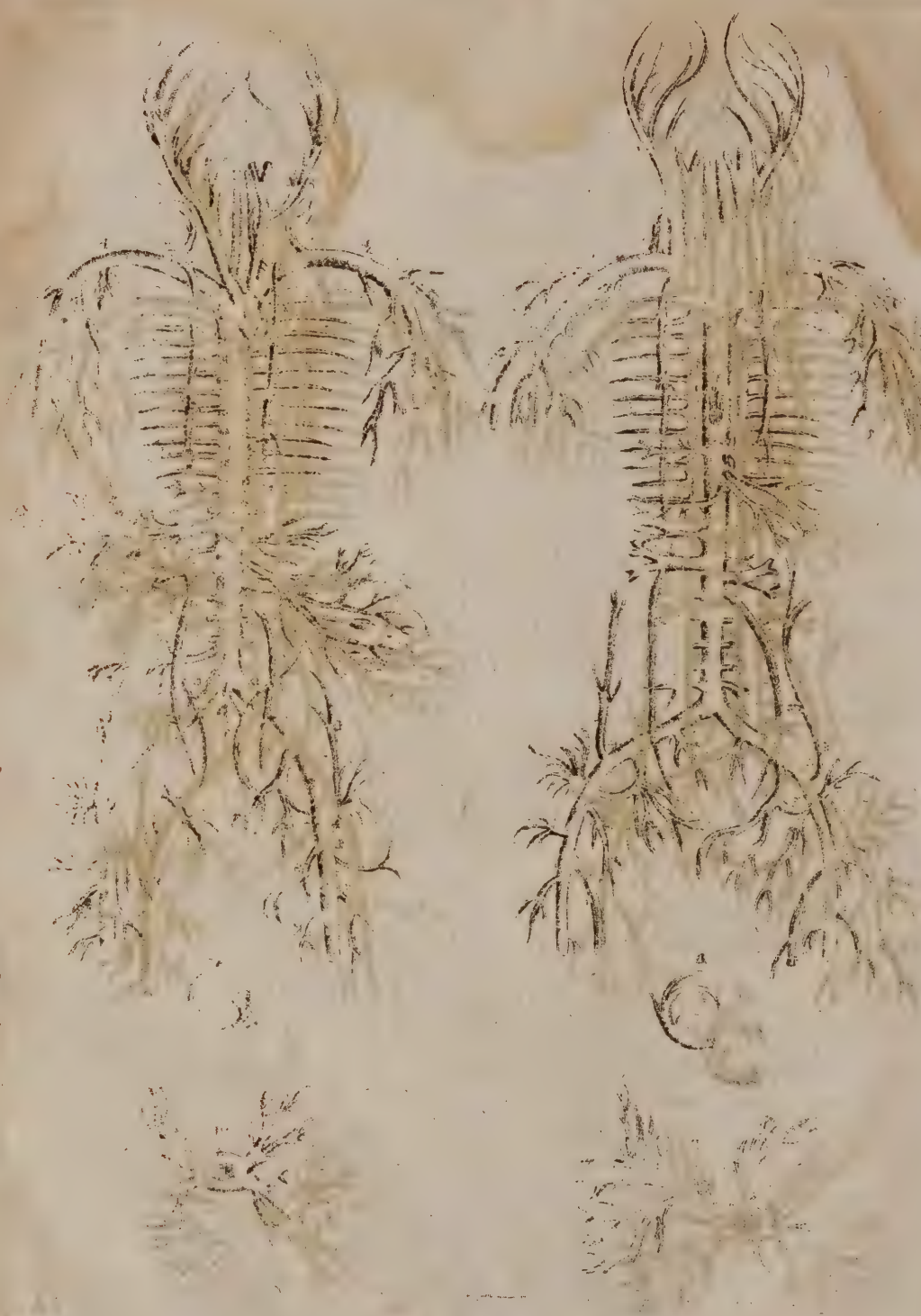


Under the *Trapezii* is the pair of Muſcles called *Rhomboides*, from their form, this alſo is peculiar to the *Scapula*; they take their beginning from the three inferior *Vertebræ* of the Neck, and as many of the ſpinous proceſſes of the ſuperior *Vertebræ* of the Back; afterwards deſcending obliquely with a fleſhy beginning and end, they are carried to the Baſis of the *Scapula*, which they move backwards and obliquely upwards. The Muſcle called *Serratus Anticus minor*, moves the *Scapula* forwards, which we mentioned in the ninth Chapter. Laſtly, the pair called *Levatorium* is proper to the *Scapula*, ſo called from their office; they take their beginning from the tranſverſe proceſſes of the ſecond, third, fourth, and fifth *Vertebræ* of the Neck, they are ſtretched downwards with a fleſhy and ſtrong end, and knit to the ſuperior angle of the *Scapula*, and lift both it and the ſhoulder up forward.

That the Muſcles of the Back may be the better diſcried, you muſt firſt ſeparate the broad pair of Muſcles, which are called *Latiſſimum Dorſi*, although they are peculiar to the ſhoulder and not to the Back, their beginning from the poſteriour proceſſes of the *Vertebræ* is broad and Membranous; they begin from the ſixt *Vertebræ* of the Back even to the middle of the *Os Sacrum*, and part of the *Os Ilium*, from hence they paſs both above and below by the ſides of the Back, till they come to the inferior angle of the *Scapula*, being fleſhy and contracted they end about the head of the Shoulder with a ſhort and ſtrong Tendon, which ſtoutly moves it backwards.

The proper Dorſal Muſcles are both thoſe called *Serratus Poſticus*, from their tooth-like productions in form of a ſaw; alſo the *Sacrolumbi*, the longeſt of the Back, and the *Semiſpinati*. Of the *Serrati Piſtici*, two are ſuperior and leſſer, two inferior and greater: The ſuperiour ariſe with a thin and Membranous beginning from the hinder proceſſes of the three inferior *Vertebræ* of the Neck, and the firſt Spine of the *Vertebræ* of the Back, afterwards being fleſhy in their deſcention; they are carried to the three or four ſuperior Ribs, according as they are endewed with two or three tooth-like productions: The inferior *Serrati poſtici*, ariſe from the Spines of the inferior *Vertebræ* of the Back, with a Membranous beginning, then running tranſverſly they are knit to the intervals of the inferior Ribs, others take the beginnings of them both, from the intervals of the Ribs, and their ends in the Spines of the *Vertebræ*, and that they conduce to the turning about the *Vertebræ*. The original of the Muſcles *Sacrolumbi*, is from the extremity of the *Os Sacrum*, their beginning is fleſhy inwards, nervous outwards, whence ariſing up about the lower *Vertebra* of the Back, they depart a little to the Ribs, from the longeſt Muſcle, into which they are inſerted with various Tendons, and compreſs the Ribs in expiratton. The beginning and progreſs of the longeſt Muſcles of the Back is from the *Os Sacrum*, *Os Ilium*, and *Vertebræ* of the Loyns, and are at firſt united to the *Sacrolumbi*, and are firſt diſtinguiſhed about the lower *Vertebra* of the Back, and beſtow their Tendines upon the tranſverſe proceſſes of the *Vertebræ* of the Back and Loyns, and they are ſtrong extenders of the Back, and of all thoſe *Vertebræ* that have proceſſes: The *Semiſpinati* ſerve alſo to move and extend the Back, they

are altogether fixed in the *Vertebræ* and furnish them with Tendons from the top to the bottom. This is certain, these three Muscles we spake of, if we consider the conjunction of their beginnings, the one-ness of their Membranes, and the community of their office, they make but one Muscle; but if we regard the multitude of their Tendons, and variety of their endings, they seem very many.

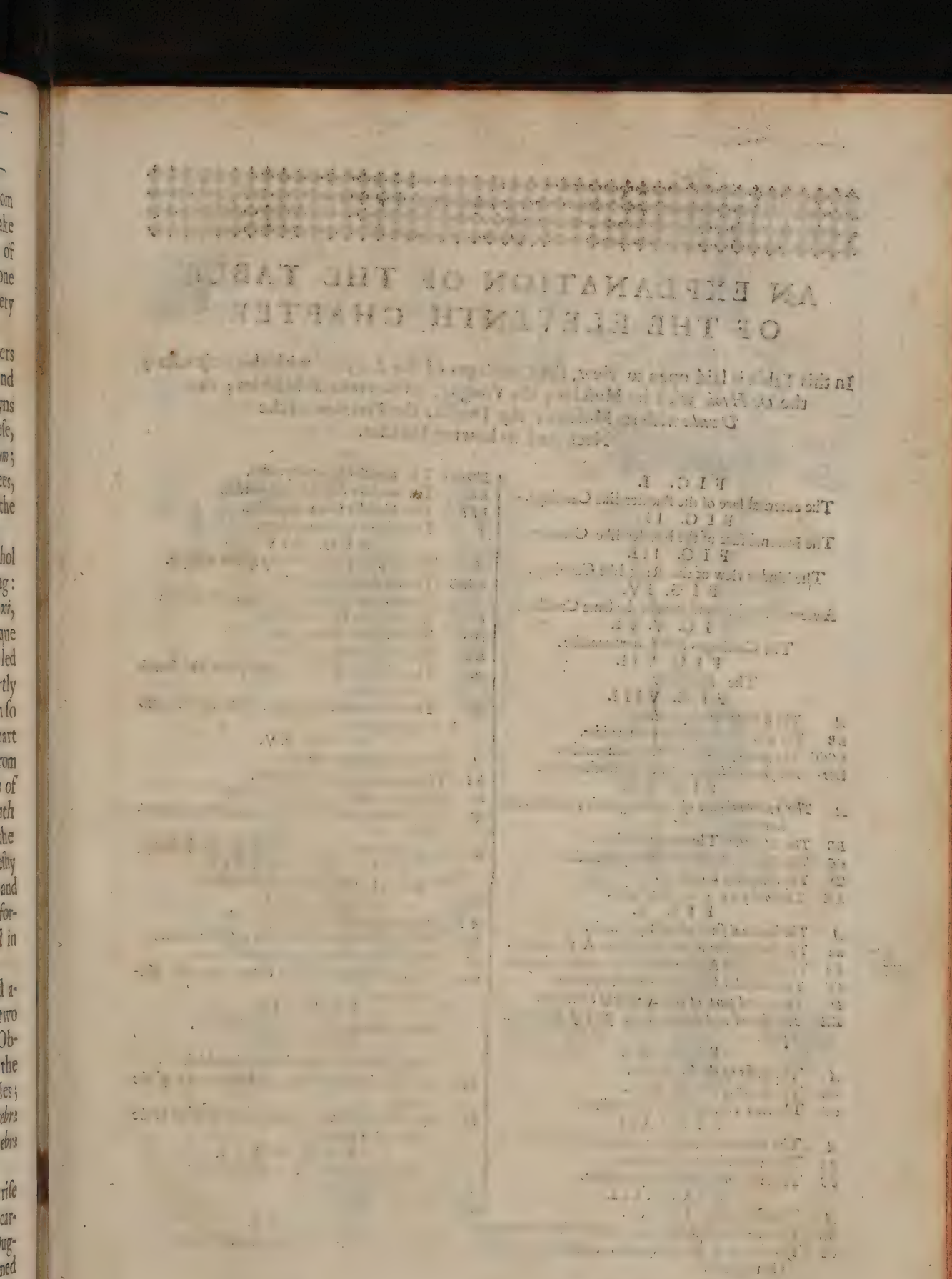
Under the *Sacrolumbi* and the longest Muscles, are the two extenders of the Loyns, called *Sacri*; these rise externally from the *Os Sacrum*, and by a various progress fasten their Tendons in the *Vertebræ* of the Loyns and their oblique processes: The bowers of Loyns are opposed to these, called *Quadrati*, which arise internally from the *Os Sacrum*, and *Ilium*; they have a large and fleshy beginning, and grow slender by degrees, and joyn themselves to the transverse processes of the *Vertebræ* of the Loyns, bowing them.

The Muscles which are referred to the Head, some move the whol Head, others certain parts of it, of which in the Chapter following: They which move the whol Head, are called, *Musculi Splenii*, *Complexi*, *Recti majores et minores* which extend it; the superior and inferior oblique Muscles move it about, the *Mastoides* bow it: The Muscles are called *Splenii* from the form of their sides, they have a double beginning, partly from the five Spines of the inferior *Vertebræ* of the Neck, partly from so many of the superior *Vertebræ* of the Breast, and end in the hinder part of the Head with somewhat oblique *fibræ*: *Complexi* are so called from the distinction of parts, they arise from the four transverse processes of the superior *Vertebræ* of the Breast, and from the Spine of the seventh *Vertebra* of the Neck, and are strongly inserted into the Head from the middle part of the Dug-like prominence: *Recti majores* are short fleshy Muscles, arising from the Spine of the second *vertebræ* of the Neck, and ending about the middle of the *Occiput*: *Recti minores* are under the former, arising from the bunch of the first *vertebra*, something divided in their progress, and end with the former.

Seeing the Head is not only to be extended, but also to be turned about, this is done by small, yet very strong Muscles; of which, two are called the Superior, two the Inferior Obliques: The Superior Oblique arise from the transverse proces of the first *vertebra*, and end in the hinder part of the Head neer the sides of the external right Muscles; The Inferior Oblique arise from the Spine of the second *vertebra* of the Neck, and end in the transverse proces of the first *vertebra* and therefore this *vertebra* being moved, moves about the Head.

The *Mastoides* being long and thick Muscles, bow the Head; they rise partly from the top of the *Sternum*, partly from the *Clavicula*, and are carried with a Body almost double and Oblique, by the neck to the Dug-like proces, from which they obtain their name; to these are joyned as companions the two Muscles in the Neck, which arise from the transverse processes of its *vertebræ*, and arise to the Basis of the Head, and bow it together with them.

These Muscles being removed, the extenders of the Neck remain, namely, two Tranversals, and two Spinals; The Transversals take their beginning



AN EXPLANATION OF THE TABLE OF THE ELEVENTH CHAPTER.

In this Table is laid open to view, the Cartilages of the *Larynx*, with their Muſcles; the *Os Hyois* with its Muſcles; the Tongue, its Nerves and Muſcles; the *Uvula* with its Muſcles; the Tonſils, the *Vertebræ* of the Neck and its bowing Muſcles.

FIG. I.

The external face of the Buckler-like Cartilage.

FIG. II.

The internal face of the Buckler-like Cartilage.

FIG. III.

The hinder view of the Ring-like Cartilage.

FIG. IV.

A view of the foremoſt part of the ſame Cartilage.

FIG. V. VI.

The Cartilages called *Arytænoides*.

FIG. VII.

The *Epiglottis*.

FIG. VIII.

A The *Buckler-like Cartilage.*
BB The *pair of Muſcles* Hyothyroides.
CCCC The *pair of Muſcles* Sternothyroides.
DD The *ſmall Muſcles called* Cricothiroides.

FIG. IX.

A The *external part of the* Epiglottis *joyned to the* Larynx.
BB The *Muſcles* Thyroarytænoides.
CC The *lateral Muſcles* Cricoarytænoides.
D The *Ring-like Cartilage.*
EE The *fore part of the wind-pipe.*

FIG. X.

A The *internal face of the* Epiglottis.
aa The *ſticking out of the cartilages* Arytænoides.
BB The *Muſcles* Arytænoides *every where looſed.*
CC The *Muſcles* Cricoaritænoides poſtici.
D The *broad part of the Ring-like cartilage.*
EE The *hinder and membranous part of the wind-pipe.*

FIG. XI.

A The *Baſis of the* Os Hyois.
BB The *horns of the* Os Hyois.
CC The *two cartilaginous Appendices.*

FIG. XII.

A The *internal face of the Baſis of the* Os Hyois.
BB The *internal face of the horns.*
CC The *two cartilaginous Appendices.*

FIG. XIII.

A The *ſides of the* Os Hyois.
BB The *muſcles* Geniohyoides *turned downwards.*
CC The *internal* Geniohyoides *commonly called* Geniogloſſi.
DDDD The *muſcles* Sternohyoides.
EE The *muſcles* Styloceratohyoides.
FFF The *Muſcles* Coracohyoides.
ſſ The *middle tendinous part.*

FIG. XIV.

A The *inferior part of the top of the Tongue.*
BBBB The *muſcles* Baſiogloſſi.
ßß The *nervous ſubſtance between the muſcles.*
CC The *muſcles* Ceratogloſſi.
DD The *muſcles* Stylogloſſi.
EE The *muſcles* Mylogloſſi.
aa The *Nerves of the Tongue from the fourth conjugation.*
bb The *Nerves of the Tongue from the ſeventh conjugation.*

FIG. XV.

A The Gargareon *or* Uvula.
BB The *external pair of Muſcles.*
bb *Its tendon which paſſeth the chink.*
CC The *internal pair of muſcles ſomething compreſſed.*
D *Part of the Pallat from which the* Uvula *hangs.*

FIG. XVI, and XVII.

Shews the *Glandulæ* called *Tonſillæ.*

FIG. XVIII.

AA The *long muſcles bowing the neck.*
BB The *muſcles bowing the neck called* Scaleni.
aa *Part of the Nerves tending to the arms.*
CC The *muſcles bowing the Head with the* Maſtoides.

FIG. XIX.

Shews the ſeven joynts of the neck.

FIG. XX.

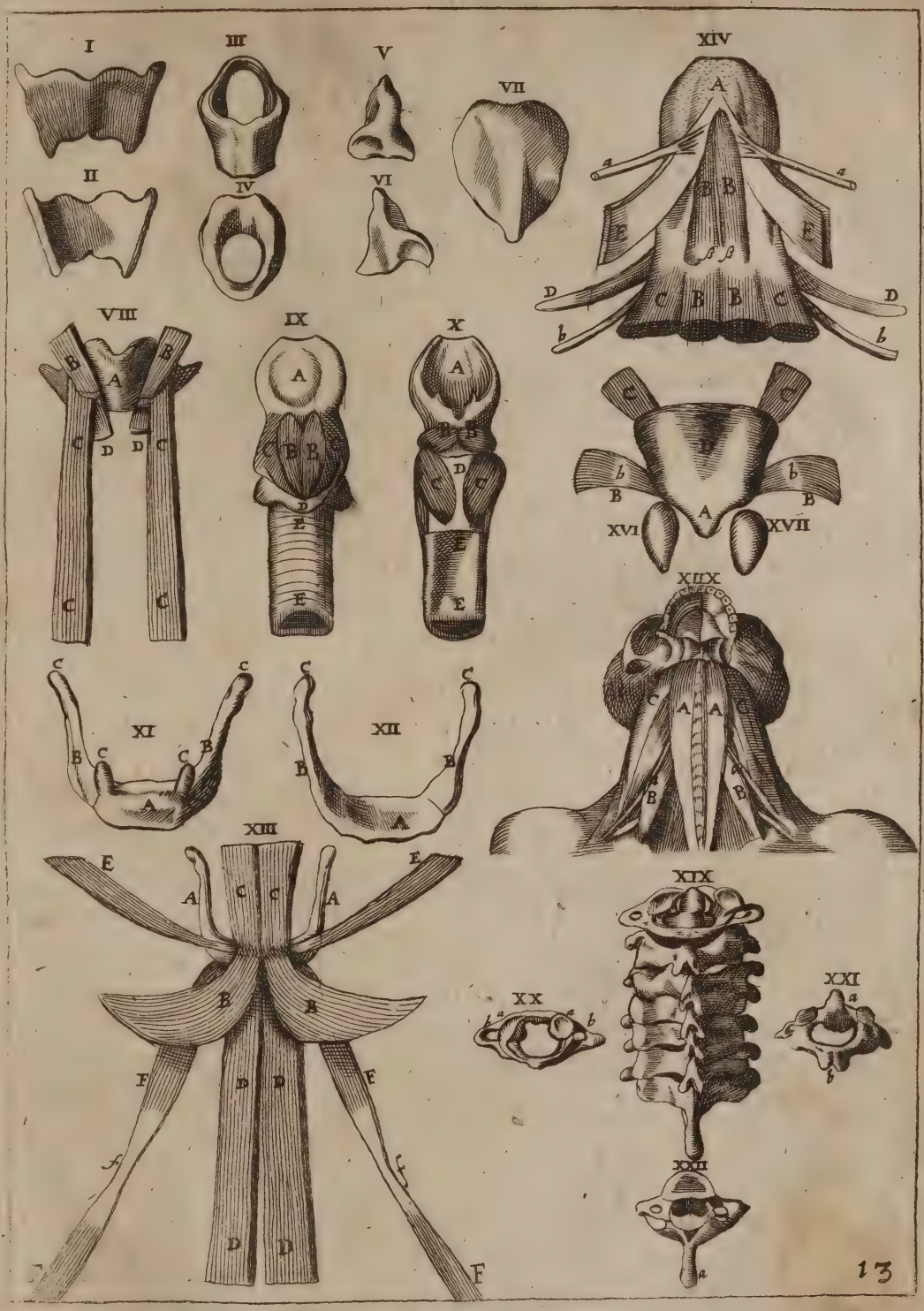
The firſt joynt of the Neck, in which
aa The *two holes holding the hinder part of the Head.*
bb The *holes on the ſides which gives paſſage to the arteries to aſcend.*

FIG. XXI.

The ſecond *Vertebra* of the Neck.
a The *tooth-like proceſs.*
b The Spina Bifidia.

FIG XXII.

a The *Spine: the reſt is like the other joynts.*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THE TABLE OF THE TWELFTH CHAPTER UNFOLDED.

It contains the Muſcles which are conſpicuous about the Shoulders, Back, Loyns, and Neck, the Carkaſs being turned over upon the Belly.

FIG. I.

AA *The muſcles* Trapezii *in their ſcituation.*
BB *The* Rhomboides *laid a little to view.*
CC DD *The broadeſt muſcle of the back, in which*
CC *Shews its fleſhy part.*
DD *Its membranous beginning.*

FIG. II.

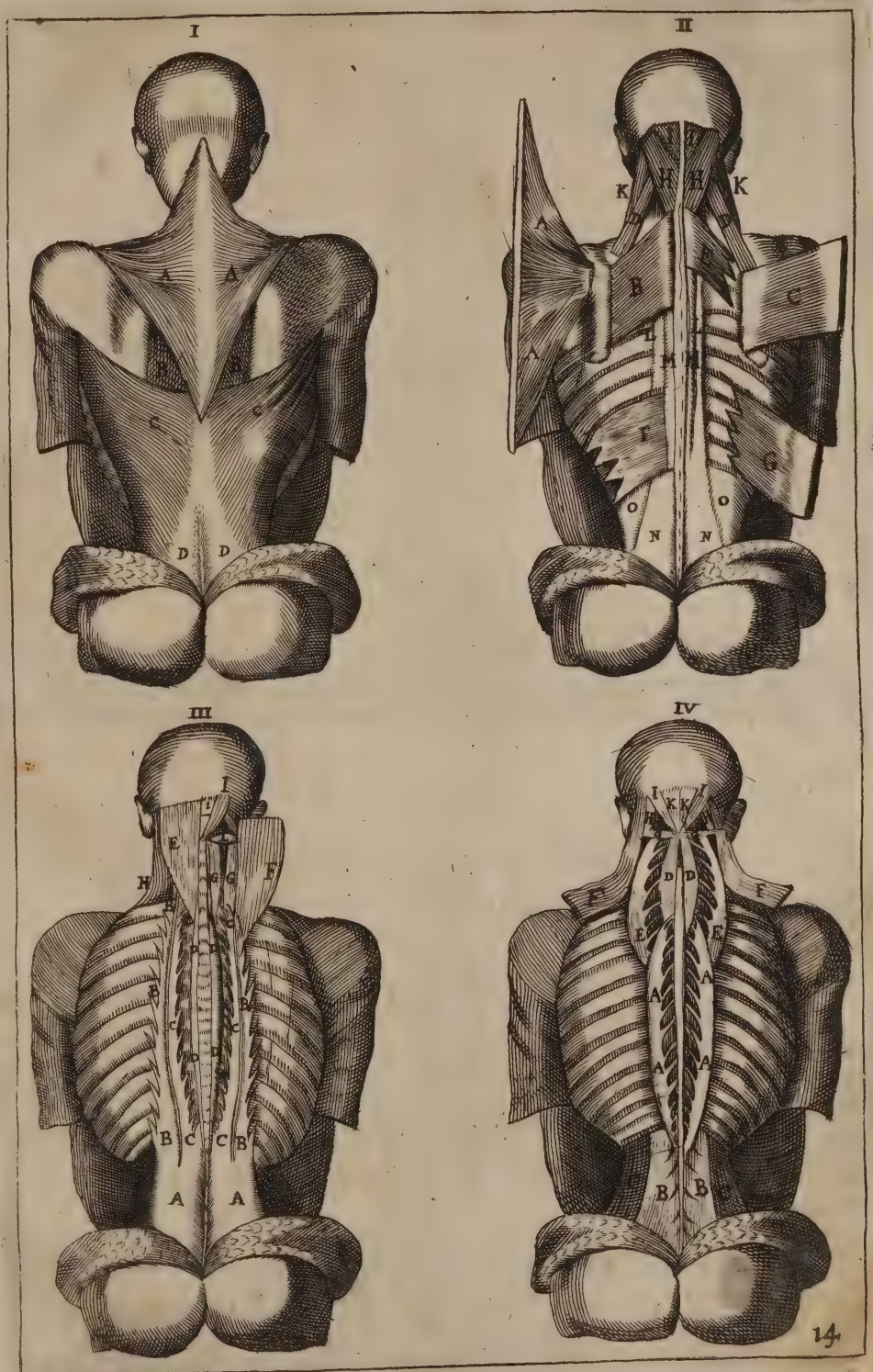
AA Trapezius *pulled out of its ſcituation.*
BB *The* Rhomboides *laid open in its ſcituation.*
C *The ſame drawn out of his ſcituation, as yet joyned to the baſis of the* Scapula.
DD *Both the Levators of the* Scapula.
E Serratus poſticus minor *in his ſcituation.*
F Serratus poſticus major *in his ſcituation.*
G *The ſame muſcle out of his ſcituation.*
HH *The greateſt part of the* Muſculi Splenii *conſpicuous in their ſcituation.*
II *A portion of the* Muſculi complexi.
KK *The* Maſtoides *ſomewhat ſeparated above.*
LL *The* Sacrolumbi *not removed out of their place.*
MM *The longeſt muſcles of the back not ſeparated.*
NN *The beginnings of the* Sacrolumbi *and longeſt muſcles united.*
OO *The muſcles* Quadrati *ſomewhat laid open.*

FIG. III.

AA *The beginnings of the muſcles* Sacrolumbi *and the longeſt united.*
BBBB *The* Sacrolumbi *ſomething moved out of their place and diſtinguiſhed in their tendons.*
CCCC *The longeſt muſcles of the back ſomewhat removed, and diſtinguiſhed into their tendons.*
DD *The* Muſculi Spinati *not ſeparated.*
E *The Muſcle* Complexus *in its ſcituation.*
F *The ſame ſeparated from the Head, that ſo the reſt may come to view.*
GG *The Muſcles extending the neck in their ſcituation.*
H *The fore part of the* Maſtoides *looſed.*
I *The greater right muſcle of the Head, drawn a little out of his place, that ſo the leſſer right muſcle may appear.*
K *The ſuperior oblique muſcle of the Head.*
L *The inferior oblique Muſcle.*

FIG. IV.

AA &c. *The* Muſculus Spinatus *pulled out of his place, that ſo the tendons may be beheld in their order; they are deſcribed at the biggeſt.*
BB *The muſcles of the Loyns called* Sacer *in his place.*
CC *A portion of the muſcles* Quadrati *in their place.*
DD *The muſcles* Spinati *in their place.*
EE *The tranſverſe muſcles of the neck deciphored greater and longer than they ſhould be, that ſo the tendons may be the better ſeen.*
FF *The* Maſtoides *ſeparated from the* Sternum, *and turned back.*
GG *The inferior oblique muſcles of the Head.*
HH *The ſuperior oblique muſcles of the head.*
II *The greater right muſcles of the head ſomething drawn aſide.*
KK *The leſſer right muſcles of the head in their place.*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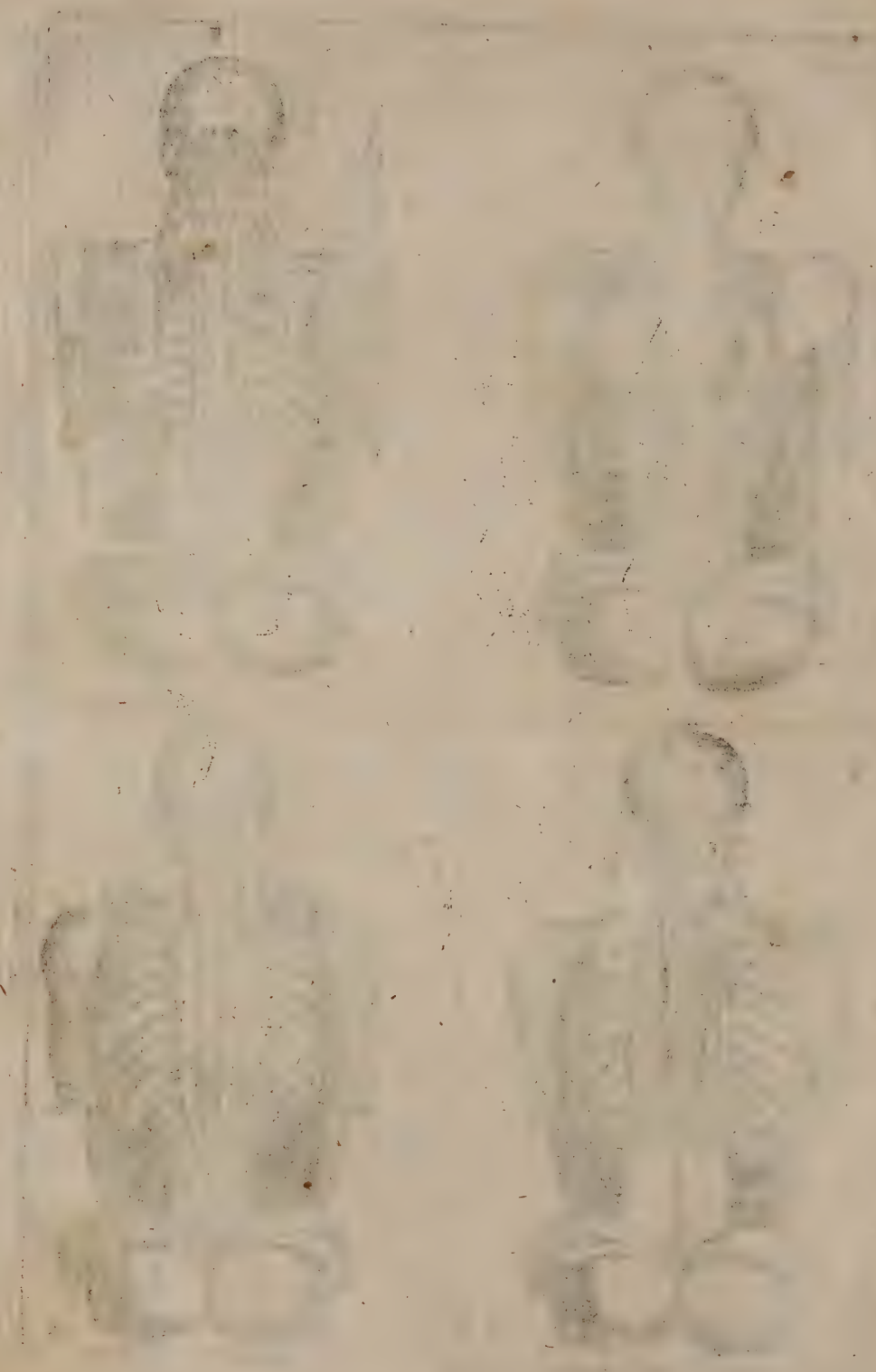

beginning from the ſix Tranſverſe proceſſes of the ſuperior *vertebræ* of the Breaſt, and end in the Tranſverſe proceſſes of the *vertebræ* of the Neck: The Spinals ariſe from the ſeven Spines of the *vertebræ* of the Breaſt, and the five Roots of the Tranſverſe proceſſes of the Neck, having various beginnings, and end in the Spine of the ſecond *vertebra*.

Place here the Table of the twelf Chapter, which hath the Number 14. *at the corner of the braſs Plate.*

CHAP. 13.

Of the external Parts of the Head, their Bones and Muſcles.

HAving finiſhed the lower and middle Ventricle, we come to the upper, which is the ſeat of thoſe noble functions of the Soul; this is bounded with the circumference of the Head: It hath the Face before, the forepart of the Head in the middle, and the hinder part behind; the external parts are to be viewed which ſerve both for covering and defence, and theſe are either common to other parts or proper to the Head, alſo the brain it ſelf and amongſt the Organs of ſences, the Eyes and Ears.

We will begin with thoſe that are common and external, of which, the skin upon the upper part of the Head is remarkable for its thickneſs, that ſo it may defend the Head the better, and give the better rooting to the Hair, which Nature hath placed thick for the ornament and ſafeguard of that part, to defend it from the cold blaſts of wind, and the parching heat of the Sun; underneath the skin is fat, but very little, leſt the thickneſs of it ſhould hinder the tranſpiration of vapors; next to the fat is a fleſhy Panicle in which we will ſhew the thin expanſions of the Muſcles in their proper places.

It hath Bones for its safeguard both various and strong; these are covered with a Membrane which is called *Pericranium*, which is thin, yet double and exquisite in sence, by reason of the Nerves distributed unto it, by the hinder part of the Head and the Temples: It is firmly joyned by Sutures by the Junctures of the Bones, even to the *Dura mater* with Nervous *Fibræ*, from whence there is an easie consent between both Membranes: The Bones of the Head are referred either to the Skull or the Cheeks; to the Skull pertain the Bones of the Fore-head, the fore and hinder part of the Head, the Temples, *Sphenois*, and *Cribriforme*.

The Bone of the Forehead is of a great bigness, 'tis usually but one, sometimes two, even in such as are grown up; it hath a double plate filled with substance like pumice; it hath a large passage to the Nostrils, sometimes 'tis single, sometimes it hath one or two bridges, which a Marrowy Body, compassed about with a green Membrane, guardeth, they say to prepare the air that passeth to the brain; its thickness, if you compare it with the fore and hinder part of the Head is mean, in figure it is almost circular, its passages are small, defending the angles of the Eyes on each side; it hath two holes about the Eye-brows, which give passage to the Nerves of the third Conjugation, although often times Nature doth not give perfect holes, but little trenches only for the safeguard and distribution of the said Nerves; To these a third hole is added for the crest of the *Os Ethmois*, which opens it self in the said hole, the Bone of the Forehead is joyned before to the Bone called *Caneiforme* to the *Ethmois*, to the ten Bones of the Cheek, above by the coronal Suture to the Bones of the fore part of the Head.

The Bones of the forepart of the Head are in number two, and are thinner than the rest, and in form unequally square, they have a kind of smoothness to the touch, and small holes for the Vessels neer the Suture called *Sagittalis*; within it is garnished with small trenches for the veins which arise up by the *Dura mater*; it is divided by its proper Suture which is called *Sagittalis*; in its circumference it is joyned to the bones of the Forehead, hinder part of the Head, and Temples.

The Bones of the Temples are also two, less than the rest in bigness, and not every where distinguished by a double *Lamen*; they are harder than the rest, and therefore called *Petrosa*, or Rocky; they are so thin about the middle that if you hold them against the light you may see through them; their form above is circular, beneath various, they stick out in diverse processes, and that externally towards the face, they have a crooked process, which being joyned with the process of the first Bone of the upper Cheek, make the *Os Jugale*; then they have a *Mastois*, or Dug-like process, because it represents the Udder of a Heifer; in age they have the *Stylois* which ends like a Bodkin, but this is more truly called an Apendix than a Process; Inwardly the Bones of the Temples make the broad Process called *Petrosum*, in which the internal Cavities of the Ears are formed, & certain smal Bones of them which we shal shew in the sixteen Chapter; It hath three Cavities, whereof, one contains the passage of Hearing, the second receives the Joynt of the inferior Cheek, the third is common to the hinder part of the Head; It hath five holes, of

which

which, the first is conspicuous in the rocky process and gives passage to the Nerve of the fift pair; the second is larger and unequal, scituated under the Bodkin-like Appendix, and sends the greater branch of the Artery *Carotis*, by the fift hole of the *Os Cuneiforme* to the Brain; the third is famous in bigness and common to the hinder part of the Head, and gives ingress to the Jugular Vein and the lesser branch of the Artery *Carotis* and egress to the Nerve of the sixt pair; the fourth is observable between the Dug-like Process, and the Bodkin-like Appendix, and sends out the hard branch of the fift pair by a long channel; the fift, which in some bodies is wanting, is placed behind the Dug-like Process, and gives a branch of the external Jugular or passage through the Skull. To these they ad a narrow hole like a chink, and unequal, which passeth a small Artery from the fore side of the rocky Process. The rest of the holes obvious in this Process, we shall handle in the History of Hearing. The Bones of the Temples are joyned to the Bones of the fore part of the Head, by the scaly or false Sutures; they stick to the Bone of the Forehead, the Wedg-like Bone, and that of the hinder part of the Head.

The Bone in the hinder part of the Head is but one in such as are grown up, being thicker than the rest, although the lower part be thinnest where it is strengthened by that long knob arising up to it: Its Cavities are nine, of which, two are remarkable, which contain the Protuberances of the *Cerebellum*; its holes are very many, of which, the greatest passeth the marrow of the Back to the *Vertebræ*; It doth not constitute the second and third hole it self, but with the bone of the Temples, of which we spake before; neer to these is the fourth and fift, which is proper to the hinder part of the Head, little and round, by which the seventh pair of Nerves descend out of the Skull; to these sometimes is added a sixt and seventh hole, to which Nature appointeth the multiplied branches of the Vertebral veins and arteries; the hinder part of the Head is more even on the outside, but internally various, and in a manner resembles a figure of five sides, it is separated from the bones of the Fore part of the Head with the Suture *Lambdois*, from the middle and sides of the bones of the Temples by the *Sphenois*, also from the first *Vertebra* of the Neck, by a double Process both for its motion and security; in its meeting with the *Lambdois* and Sagittal Suture, sometimes there is a smal bone of a Triangular form, sometimes with a single, sometimes with a double *Lamen*, although not exactly produced to the opposite places, which is an excellent Antidote for the Falling-sickness; to this, Nature often forms lesser bones, which are like to it, between the Liniaments of the true Sutures, consisting usually of a simple *Lamen* joyned to the inferior *Lamen*.

The *Os Sphenois* or Wedg-like Bone, makes up the Basis of the Skull; it is only one in such as are grown up, various in respect of thickness and thinness, and manifold in Form, for it is garnished with many Processes, of which, some are external; and of these, some on the fore part, and for their figure sake are called *Perigoides*, or Wing-like, others on the back part, which are stretched out with two Tops towards the Bodkin-

like Appendix; the internal Proceſſes are various as well as the external, of which two are forewards, and form a broad beginning, end in a point, the backward Proceſſes are as many, which are ſtretched out broad, when they are elegantly formed they have two points in their extremities lightly bowed in the middle; and theſe proceſſes together with the ſpace between them, are compared by Authors to the Saddle of a Horſe; the Cavities of the *Os Sphenois* are many, that wch is produced in the middle of the Saddle is famous above the reſt, & receives the *Glandula Pituitaria*, neer which two others ariſe, which are ſmaller, alſo they are worthy to be noted which are in the wing-like Proceſſes, which are long and deep Cavities and give ſecurity to the internal Muſcle called *Pterigois*: In both ſides of the *Sphenois* are ſeven holes, of which, the firſt is neer the foremoſt proceſs of the Saddle, and admits the optick Nerve to the Eyes; the ſecond from a round beginning ends in a chink, and through it is the ſecond pair of Nerves and a Branch of the third carried to the Eye; alſo a large Branch of the Artery *Carotis* with the abounding humidity from the *Glandula Pituitaria*; the third hole which is under the ſecond is very little and round, by which a Branch of the Nerve of the third pair is carried to the temporal Muſcle, and *Pterigoides*; the fourth is on the external ſide of the Apple of the Eye, and reſembles a large ditch unequally broad rather than a hole, by which the firſt branch of the Nerve of the fourth Conjugation, with that of the third pair is diſtributed to the temporal Muſcle, and deſcending to the bottom of the upper Jaw, it is diſtributed partly to the Noſe, partly to its ſixt Bone, and ſends a ſmall branch to be diſtributed to the Pallat; the fift hole is under the poſterior Proceſs of the Saddle, long and rough, and gives paſſage to the greater Branch of the Artery *Carotis*; the ſixt is obſervable on the external ſide of the ſame, oval in figure, and gives extramiſſion to the fourth pair of Nerves; the ſeventh is neer the ſixt, very ſmall and round, and ſends the ſmaller Branch of the Internal Jugular Vein, to the *Dura Mater*: The *Os Sphenois* is joyned to the firſt Bone of the upper Jaw, as alſo to the fourth and ſixt below the Pallat, on the ſides to the Proceſſes of the Bones of the Temples, before to the bone of the Forehead, and behind to that of the hinder part of the Head, by tke Sutures called *Mendoſæ* and *Harmoniæ*, which age moſt commonly obliterates.

The *Os Ethmois* or Sieve-like Bone, is leſs than the orher Bones belonging to the Skull, and various in habit, it ſeems to be compoſed of ſix parts, of which the firſt and ſecond is full of holes like a Sieve, and thence came the name to the whol Bone; it is covered with the *Dura Mater*, but it is full of pores, not only to take in air and ſmels, but alſo to put out excrements: the third is the interior proceſs, not much unlike a Cocks Comb, riſing between the Nerves of ſmelling, or the Papillar Proceſſes of the Brain: the fourth is another part of the Proceſs oppoſite to the former, thin yet hard, and diſtinguiſheth the the Noſtrils above: the fift nnd ſixt parts are altogether ſpongious and full of holes, and guard the upper Cavities of the Noſtrils on the ſides, and almoſt equals the wideneſs of them: It is joyned to the Bone of the Forehead and to

the

the second of the upper Jaw, and to the *Os Sphenois* by light *Harmonia*, which old age sometimes takes away.

The Jaws follow, of which, the superior is composed of twelve bones, six on each side; the first is joyned to the external angle of the Eye, and the foreward process of the Bone of the Temples, and by their processes, make the *Os Jugale*: The second makes the inner angle of the Eye, and hath a large passage, by which the overflowing moisture of the Eyes descends to the Nostrils: The third is interposed between these two: The fourth is the greatest of all, and occupies a great part of the Cheek and Pallat, and gives holes to the upper teeth; it hath a conspicuous hole neer the apple of the Eye, by which a Nerve passeth from the third pair: The fift, together with its fellow, makes up the Nose: The sixt, with its fellow makes up the extremity of the Pallat; and all these are joyned rather by *Harmonia* than Sutures.

This Jaw is accounted movable in the *Crocodile* by the Ancients, not distinguishing his small Skull from his huge Jaw, with which it is lifted up when he moves his Jaw, his Body being neer the Earth by reason of the shortness of his feet; for what Bones soever make the superior Jaw in *Crocodiles* either of the Land or Water, are firmly joyned to the Skull by *Harmonia*: neither is it otherwise in Serpents and Fishes, in all which is the nexure of Bones; neither are there any Muscles properly moving the superior Jaw.

The inferior Jaw in age is but one Bone, famous both in hardness, thickness, and strength; It hath two Processes, the one acute called *Corone*; the other obtuse called *Condylus*: It hath holes for the Teeth as the superior Jaw hath: In the internal Superficies it hath two holes, for the beginnings of the aforesaid processes, by which a Branch of the Nerve of the fourth Conjugation is admitted to be distributed to the Teeth, In the external Superficies it hath also two, by which the same Branch passeth forwards to the lips, their Muscles and Skin: Lastly, by its thicker Proces it is joyned to the rocky Bone, a Membranous Ligament being between.

The Jaws are singularly armed with the Teeth, which are small Bones and serve not only the chew the meat, but also by resisting the refluxion of the air, they help the better to pronounce the words: each Tooth receives an Artery from the *Carotides*, small veins from the Jugulars, and Nerves from the Branch of the fourth pair by which the *Periostion* which covers the Roots of them, and also the Teeth themselves are exquisite in sence. In Women there are fourteen, in Men fifteen, and often sixteen in one Jaw; in Men they are of a mean bigness, and differ partly in figure, partly in office; for some are sharp, which are called the Dog-Teeth; others, although they are acute, yet they have broader extremities than the Dog-Teeth, and are called Cutters, others are called Grinders, the furthermost of which come forth either in Man-hood or old age, and are called the Teeth of wisdom: the Cutters are four, placed before, and are the first that appear in Children, on both sides of which, is a Dog-Tooth added, which are called Eye-Teeth, the rest of the Jaw the Grinders occupy, which are large, broad, and something unequal,

equal, they are placed in the holes of the Jaws, either with three or four roots, or with but one, as the Cutters and Dog-Teeth, their junCture the Ancients call *Gomphosis*.

The Muscles which move these parts of the Head, remain yet to be spoken of, to wit, the Forehead, Eye-lids, Nose, Ears, Lips, and Jaws; On each side of the Forehead is one, which descending from its middle region is ended in the Eye brows, which lifteth it up, and wrinkles it.

Two Muscles shut the Eye-lids, which by a semicircular Production, being extended from the internal angles to the external, shut them, and yet they are more properly one Muscle than two; to these they ad the Ciliar Muscle, which compassing the brims causeth the more exquisite shutting: A singular Muscle opens the Eye-lids, of which in the Fifteen Chapter.

The Muscles on each side lift up and diduce the Muscles of the Nostrils, of which the first is like a Triangle, and descends from the top of the Nose by the sides, even to the wing; the other ariseth from the Bone of the Jaw neer it, and ends partly in the exterior wing of the Nose, and partly in the upper part of the Lip, thereby moving and lifting both of them up: Two slender Muscles dilate the wing of the Nose, which run Transversly by the top of the Nose; to these within the wing are two Muscles opposed, which are like them in bigness, produced from the extremities of the Bones of the Nose, and opened in each of its wings, which gently bind to the Nose, although the orbicular Muscles of the Lips help forward and finish this office.

The Muscles common to both Cheeks and Lips are called both the *Quadrati* and *Buccinator*; *Galen* calls the *Quadratus* a Mnsculous expansion, for indeed it is a Membrane placed under the fat, but hath an oblique contexture of fleshy *fibræ*; its beginning is broad from the *Sternum*, *Clavicula*, Neck, and Shoulder, it ends in the Chin, where sticking to the inferior Jaw, it draws it and the parts adjoyning to it downwards; the other is called *Buccinator* because it swels up in such as blow the Trumpet: It takes its original from the Gums of the upper Jaw, and being compassed within with the common Tunicle of the mouth; it ends in the inferior Jaw, and makes the inward hollowness of the Cheek.

Properly five pair of Muscles are subservient to the Lips, of which the first lifts up the upper Lip: Its beginning is from the upper Jaw where the Cavity of the Cheek is, and being compassed about with much fat it descends to the upper Lip; neer this from the very same Jaw ariseth another pair, thin and broad, which being inserted into the Lip moves it upwards: The third pair is fleshy and round, arising from the *Os Jugale*, and passing obliquely by the Cheeks, ends in the confines of both Lips, and draws them upwards to the sides: The fourth pair riseth a little lower, neer the sides of the inferior Jaw, and from a broad beginning by an oblique Process becomes slender, which draw the inferior Lip downwards being inserted into the sides of it neer the end: The fift pair which is most conspicuous in fleshy Bodies, ariseth about the middle of the Chin, and ascendeth with right strings to the nether Lip, and depresseth

AN EXPLANATION OF THE TABLE OF THE THIRTEENTH CHAPTER.

This Table contains the Muſcles of the Face and inferior Jaw; alſo the bones of the Skull, and of both Jaws.

FIG. I.

AA The skin of the Head detracted.
BB The fleſhy Pannicle ſeparated.
CC The Pericranium detracted.
DD The Skull bare.
E The muſcle of the Forehead.
FF The muſcle that ſhuts the Eye-lids.
G The firſt muſcle of the Noſe.
H The ſecond muſcle of the Noſe.
I The muſcle dilating the wings.
K The muſcle of the firſt pair lifting up the Lips.
L The muſcle drawing the Lip upwards.
M The muſcle drawing the Lip downwards.
NN The muſcle ſhutting the Lips.
O The Buccinator.
PP The temporal muſcle in his place.
Q The muſcle lifting up the Ear.
R The muſcle drawing the Ear obliquely.
S The muſcle Maſſeter in his place.
TT The muſcle Digaſtricus moved from his beginning.

FIG. II.

AAA The temporal muſcle out of his place, the Jaw being diſſected.
aa Its acute inſertion into the proceſs of the Jaw.
BB The Maſſeter ſeparated.
CC The Digaſtricus looſed at the end, and drawn aſide.
DD The internal Pterygoides.
EEEE The external Pterygoides.
F The Muſculus Quadratus, or muſculous Expanſion ſeparated.

FIG. III.

A The bone of the forehead.
aaa The Coronal Suture.
a The hole of the bone of the forehead for the Nerve of the third pair.
B The right bone of the fore part of the Head.
bb The Sagittal Suture.
C The left bone of the fore part of the Head.
D The bone of the Temples.
cc The falſe Suture.
d The Duglike proceſs.
e The proceſs of the Os Jugalis.
E The firſt bone of the upper Jaw.
F The Jugal proceſs.
G The ſecond bone of the Jaw hid with the ſhadow of the former.
H The third bone.
I The fourth bone of the Jaw.
i The hole in it for the Nerve of the third pair.
K The fift bone.
L The lower Jaw.
l The hole in it for the Nerve of the fourth pair to paſs out.
M The ſharp proceſs of the inferior Jaw.
N The blunt proceſs of the inferior Jaw.

FIG. IV.

A The left bone of the fore part of the Head.
aa The Sagittal Suture.
B The right bone of the fore part of the Head.
bb The Suture Lambdois.
C The bone of the hinder part of the Head.
D The triangular bone.
e A portion of the bone of the Temples with the Duglike proceſs.

FIG. V.

AA The cavity of the bone of the hinder part of the Head within the Skull, in which the Cerebellum lies.
B The internal face of the Os Sphenois.
CC The Os Ethmois.
D The cavity of the bone of the forehead above the Noſe.
aa The firſt hole in the wedglike bone.
aa The ſecond hole.
bb The third hole.
cc The ſixt hole.
*** The ſeventh hole.
dd The fift hole.
ee The firſt hole of the bone of the Temples.
ff The rocky proceſs of the bones of the Temples.
gg The third hole of the bones of the Temples.
hh The fourth and fift hole of the hinder part of the Head.

FIG. VI.

AA The lower part of the bone of the hinder part of the Head conſpicuous.
aa The proceſs by which the hinder part of the Head is joyned to the firſt Vertebra of the Neck.
BB Part of the bone of the Temples.
CC The duglike proceſs.
DD The bodkinlike appendix.
EE The jugal proceſs.
F The External face of the Wedglike bone.
GH GH The winglike proceſſes.
I The bone which diſtinguiſheth the Noſtrils.
KK The ſixt bone of the upper Jaw.
kk The hole which paſſeth the Nerve of the fourth pair to the Pallat.
LL Part of the fourth bone of the ſuperior Jaw.
m The four Teeth called Cutters.
nn The two dog teeth.
oo The reſt of the Teeth called Grinders.


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preſſeth it: To theſe the binder together of the Lips is to be added, which their ſoft and ſpongy ſubſtance makes, which conſiſts of *fibræ* turned in an Orb like a *Sphincter*: As for the Muſcles of the Ears we ſhall ſpeak of them when we ſpeak of the Ears themſelves, amongſt which are thoſe called *Occipitals*.

The motion of the inferior Jaw is very ſtrong, and moved by ſtrong Muſcles, which are in number alſo five pair, the firſt pair is called *Crotaphites*, or Temporals, becauſe being covered with the *Pericranium*, they ariſe with a thin and broad beginning, about the fore part of the Head and Bone of the Temples, the neerer it comes to the *Os Jugale* the thicker it is, under which deſcending, it ends in the acute proceſs of the inferior Jaw, with a ſhort yet ſtrong Tendon, this draws it upwards: Its *fibræ* the more they recede from the middle, the more they paſs obliquely toward the Tendon: wounds hapning in this pair of Muſcles are not equally alike dangerous, for in its ſuperior region being wounded by oblique ſtroaks, the hurt avoids death, in which place when by a fall the bone of the Temple is crackt, the life may be ſaved by ſetting to the trepan, but ſuch hurts as afflict the lower and nervous part of it, endanger life by convulſions. The ſecond pair is called *Digaſtricum* or *Biventre*, and takes its original neer the Dug-like Proceſs, this in its middle paſſage grows to a Nervous or Tendinous Body, then it is fleſhy again till it come to the fore part of the Chin, where it ends inwardly and draws the Jaw downwards, in which motion Nature hath provided a Ligament to ſtop its falling back too far: The *Muſculus Quadratus* ſpoken of before concurs in office with this. The third pair is called *Laterale*, and *Maſſeterium*, having partly a Nervous, and partly a fleſhy beginning, ariſing from the ſuperior Jaw and *Os Jugale*, and are broadly and ſtrongly inſerted into the nether Jaw, which by reaſon of the diverſity of its ſtrings, it moves to the right and left, and forwards. The fourth pair is called *Pterygoides*, or the internal Alar, ſo called becauſe it proceeds from the internal feat of the Wing-like Proceſs: it is fleſhy and carried to the inferior part of the inward part of the inferior Jaw, by a broad and ſtrong Tendon, which it draws up, and when it is turned out, it draws it back. The fift pair is called *Pterygoides* or the external Alar; this begins often with a double body, and fleſhy, from the external ſide of the wing-like proceſs, and is alſo faſtned in the internal ſide of the lower Jaw: It withdraws the inferior Jaw and moves it forwards.

Place here the Table of the thirteenth Chapter, which hath the Number 15. *at the corner of the braſs Plate.*

CHAP. 14.

Of the Brain. and Cerebellum

THat the Brain it ſelf which is the Temple of Wiſdom and Memory may come to view, it is neceſſary that we take away its coverings, and they are two Membranes, which the *Greeks* call *Meninge*, and the *Arabians*, *Mater*, and our Chyrurgians from them: the *Arabians* uſing to expreſs the ſoft ſeat or covering of any thing by the name *MOTHER*.

Of theſe, that which doth not immediately cover the Brain, is called *Craſſa Meninx* or *Dura Mater*, and it is endewed with not a few Veins and Arteries which aſcend by the ſides of it: The Veins come from the foremoſt Branch of the internal Jugular, the Arteries from the greater and leſſer Branch of the internal *Carotis*, both of them repleniſh it with Blood and vital Spirit; It looſly embraceth the Brain that ſo it may not hinder its increaſe; it is rough without, and ſmooth within, it is doubled with a double Proceſs, of which, that which is ſtretched forwards above the middle of the Brain, for the figure ſake, is called *Falx*, becauſe it reſembles a hook; the other is ſhorter, and defines the bounds of the Brain and *Cerebellum*.

By theſe Proceſſes are certain Cavities or Channels made, ſome greater, ſome leſſer; Of the greater, two climb up the *Cerebellum* to the right and left by an oblique paſſage, by the ſides of the hinder part of the Head, and in their beginnings they admit the greater Branch of the internal Jugular Vein; the third of the greater Cavities, being ſtretched along the longitude of the *Falx*, diſperſeth copious branches both to the *Meninges* and alſo to the middle of the Skull; here is often a collection of excrements and a filthy putrifaction, and ſometimes callous matter and ſtones found in a Diſſection; the fourth of the greater Cavities is ſhorter, paſſing between the *Cerebrum* and *Cerebellum*, two Branches being firſt produced, it is partly beſtowed upon the callous Body, and partly enters in two parts, the foremoſt Ventricles of the Brain, making a portion of the plexure called *Chorois*: Where there is a concourſe and community of theſe Cavities, there that Funnel called *Herophilianum* is conſtituted: The *Dura Mater* is firmly joyned to the Sutures of the Skul, eſpecially to the *Os Sphenois*; at other places it is at diſtance both from the Skull and the *Pia Mater*, as the increaſe and decreaſe of the Brain requires.

The other Membrane for the diverſity of its habit is called *Tenuis Meninx* and *Pia Mater*: It is a very thin and ſoft Membrane, not only wrapping the Brain round, but alſo enrowling the turnings of many Veins

Veins and Arteries which accompany it, which may be easily separated from it.

The word *Brain* comprehends both that properly called so, and also the *Cerebellum*, it is made of a cleer substance of the Seed, and makes the animal Spirit, by which the Soul which is the Governess of the Body performs both Sence internal and external, and also voluntary motion, therefore in living Bodies it is swelled with gentle heat and Spirit; in dead Bodies being dissected in thin slices it shines like Alablaster: The Ancients thought the Brain was clouded or obscured by Melancholly, or vapors drawn up thither; *Hippocrates* rightly conceived that wounds passing deeply into its Cavities were mortal, and yet here is a huge difference, either by reason of different properties in Nature, or the ambient air, for light offences either of the Skull or *Meninges* kill some presently, and others whose Brain it self is wounded escape, yea, although some part of it be taken away, and separated by reason of putrifaction, also the wound growing together, the leaden Instruments used in the cure, remain many yeers fixed in the Brain and *Meninges*.

The Brain receives Veins on each side from the internal branches of the Jugulars, and small passages from the Cavities of the *Dura Mater* carrying Blood: It hath Arteries from the *Carotides* and those which rise up by the *Vertebræ*, which have but a single Tunicle like the Veins; the substance of the Brain hath no Nerve at all, and therefore 'tis void of sence, although it give original to all the Nerves.

Its largeness in Man is famous, and it increaseth and decreaseth as the *Moon* doth; it is divided into the right part and the left, by the Hook-like Process of the *Dura Mater*; it hath diverse Cavities which we shall lay open in the particular dissection; it hath an evident heat, although compared with the other Bowels which are hotter, it may be accounted cold and moist; also it is made moist by accident, seing the vapors sent unto it from the Breast and Stomach, are turned into water, from whence flowing to the inferior parts (if it have not power to resolve them) it brings sickness in the small Guts: It is garnished with many circulations like the River *Meander*; above, it is round like a Sphere, and therefore *Pliny* calls it the Heaven of Man, because in figure it imitates the most Sacred and Noble part of the World: It is seated by the most wise God, within the strong defence of the Skull, and the *Dura Mater*: The Brain is moved like the Arteries, not so much by any inherent vertue of its own, as by vertue communicated by the Heart.

The *Cerebellum* is another part of the Brain, produced of the same substance with its self, and endewed with the same Vessels although fewer in number; it is nothing neer so big as the Brain, and must yeild to it in roundness, but it consists of more *Lamens*, it is hid within the large Cavities of the hinder part of the Head, and its office is consecrated to the *MEMORY*.

These things thus premised we come now to the Method of Dissection, wherein the distinctions of the substances of the Brain are to be viewed, as also the callous Body; the two foremost Ventricles, the *Speculum Lucidum*, the *Fornix*, the *Plexus Choroides*; the third Ventricle

and beside that the Eminences in the fore and hinder part of it, then the Brain being deduced to the sides, and the shorter Process of the *Dura Mater* being drawaway the Nerves of smelling: The first, second, third, fourth, and fifth Conjugation of Nerves, the *Infundibulum* and *Glandula Pituitaria* are to be observed, then the Brain and *Cerebellum* being turned to the right side, the *Rete Mirabile*, the Process and Cavity of the *Cerebellum* which is called the fourth Ventricle, and the beginning of the Marrow of the Back comes to view.

The substance of the Brain is double, the external which is softer and of a more ashy or yellow colour, and the internal which is more solid and white; this they compare to the Marrow, the other to the Bark.

The *Corpus Callosum*, or Callous Body is a hard portion of the Brain, conspicuous between its foremost division, under the sides of which the two foremost Ventricles lies: These Ventricles are the largest Cavities of the Brain, compassed with a thin skin, and by their bowing exceed in length its Marrowy substance, on the upper part from a broad and blunt beginning it grows something sharp towards the third Ventricle or common Cavity; from hence on the backward parts, they grow roundish again downwards towards the Basis of the Brain, and being bowed like a hook toward their first beginning, they are attenuated, and end neer the original of the Optick Nerves: They are divided into the right and left Ventricle, a thin partition passing between them and the substance of the Brain, which being withdrawn and held against the light is transparent, and therefore called *Speculum Lucidum*.

To this is joyned above, the *Fornix*, or vault, being a callous substance of the Brain; it obtained this name because like the vault of a House, it sustains the waight of the Brain, which else would fall down into the Cavities: It is underpropped with three legs, of which two are stretched out downwards towards the Basis of the Brain, and embracing the root of the Marrow of the Back neer the sides, which a singular prominence being neer, with a crooked vally they design the inferior Cavity of the foremost Ventricle on each side; *Arantius* gave the name of *Hippocampus* or Sea-horse, and Silk-worm to them: the third leg of the vault is stretched forward over the common Cavity of the said Ventricles.

Besides in the foremost Ventricles is obvious, the *Plexus Choroides* made of a subtil Membrane, and very small *Glandulæ*, and smal branches of vessels variously infolded, both from the fourth Cavity, and the branches of the *Carotis* and Vertebral Arteries; That neat and wonderful distribution is seen by the lower Cavity of the Ventricles, in which, even as in the *Rete Mirabile*, the Blood is prepared for the Generation of the animal Spirit in the Brain; But the Ventricles before mentioned, together with those that follow, by the aprobation of Modern Physitians, are ordained for the collection of air and abounding flegm.

The chink, which is in the valley of the foremost ventricles, being lightly drawn aside makes the third ventricle of the Brain, according to the opinion of the Ancients; in which two passages are observable, of which the foremost is carried down to the Funnel, a Process sticking up,

which

which they compare to a womans Privities; the hinder which they liken to the Fundament, is carried to the Cavity of the Marrow of the Back, and shews that space, which the beginnings of that marrow make by their mutual concourse, being famous with four protuberances, and maketh the fourth ventricle constituted between the Brain and *Cerebellum*; But that Cavity which the principal Authors of Anatomy call the fourth ventricle seeing it properly belongs to the *Cerebellum*, we will speak of it, when we come to it in order of Dissection.

Of those Protuberances, some are lesser and proper to the Brain, which are called Testicles; others greater, and called Buttocks from a certain similitude they bear to those parts: The *Glandula Pinealis* is neer these, so called because 'tis like a Pine-nut; It is in substance somewhat hard, reddish, easie to be resolved, and compassed about with a thin Membrane; it is set before the hinder passage of the third ventricle, to wit, the channel that passeth to the beginning of the Marrow of the Back: Now the superior parts of the brain being taken away by Dissection and drawn to the side, the *Cerebellum* appears, and the Basis of each beginning of the marrow of the back, from whence the Nerves take their common original.

The Nerves are vessels of the same substance with the Brain, thin and white Chords (if you except the first and second pair) which being coupled together by the *Meninge*, make long and round Channels, by which the Animal Spirit, which is the Author of sence and motion, is carried to the several parts of the Body; they have Veins and Arteries for their nourishment and vital heat; they have no Cavity discernable to the eyes, seing they seem to contain a whitish marrow within, which both wounds and obstructions in them sufficiently manifesteth, the dilligence of Nature in preserving them is admirable, for it brings the Nerves to the parts they are appointed for by a certain flexure; as they pass the holes of the *Vertebræ*, it defendeth and strengthneth them with a seminal substance, most of them make a plexure one with another, and make a substance like a swelling or contraction ere they pass further, as though they would unite their strength; in their progress they are harder.

Amongst the Nerves which take their original within the Skull, the Nerves of smelling come first to view; they take their slender beginning from the Basis of the Brain, beyond the hole of the rocky Process, which gives passe to the Nerve of the fift pair, and by degrees growing neerer together and thicker, they are extended above the *Os Ethmois*: the Process called *Crist* passing between, they make the swelling Processes called *Mamillaxes* with their extremities, and these in such Creatures whose smell is strong, are larger.

The next pair are the Optick Nerves which the Ancients held to be the first, they are great but soft and more porous than the rest, they take their original backwards, from the beginning of the marrow of the back, where the two legs of the vault are stretched out, in the midst of their journey they are joyned that the spirit might more easily pass from one eye to another, then being separated they pass through each

hole of the wedg-like Bone, to the right and left Eye, this pair being taken away, the *Infundibulum* comes in sight, being a Membranous Channel like a Funnel, growing narrower by degrees from a broad Basis, and carries the redundant flegm to the *Glandula* under it: The *Glandula* it self is called *Pituitaria*, and is placed in the Saddle of the Wedg-like bone, and sends the moisture it receives by the holes next to it to the Pallat.

The second pair of Nerves are those that move the Eyes, and are therefore called *Motorium*; they take their original neer the former: at their beginning they are joyned, afterwards being severed, they pass to the Eyes by the second hole of the Wedg-like Bone, and to the Muscle which lifts up the upper Eye-lid, to the *Adductor* and the lesser oblique Muscle; to this we adjoyn that Nerve which is called the lesser Branch of the fift pair, which coming from the middle Basis of the Brain, passeth to the Muscle of the Eye called *Abducens*.

The third pair of Nerves takes its original behind from the basis of the Brain, and in its progress is joyned to the former in the hole of the Eye, which when it toucheth it is divided into two branches whereof one passing above the Eye by the bony Channel, or hole of the Forehead, is distributed to the upper Eye-lid, the Skin, and the Muscles of the Forehead: The other branch passeth under the eye, and proceeding between the two long *Lamens*, and sending branches both to the tunicle of the Nostrils, and to the temporal Muscle, it passeth by the hole of the fourth bone of the upper Jaw, to the Muscles of the upper Lip and others of the Face; some call this the first branch, some the first and second of the third pair, which joyns it self to the fourth pair; to this third pair we ad that small Nerve, which arising from the Basis of the Brain neer the prominences which are called Testicles entring the Apple of the Eye is carried to his Muscle called *Trochlea*.

The fourth pair ariseth from the Basis of the Brain with the former, but a little before it, and descends by the sixt hole of the Wedg-like bone, and after in its passage it hath bestowed branches upon the temporal Muscle, the internal Alar and the *Buccæ*, to the Teeth of the upper Jaw, the Pallat and Gums, it is carried into the internal hole of the lower Jaw, and gives branches to the roots of the Teeth, and passing out again at the external hole of the same Cheek, its distributed in the inferior lip and his skin, the branch of this pair which remaineth, passing by the Muscles in the mouth, it is distributed to the sides of the Tongue: That small Nerve is nothing else but a branch of this pair which the Ancients called the fourth pair, thinking it to be a pair by it self, and is distributed in the Pallat and his Tunicle.

The fift pair ariseth from the very beginning of the marrow of the Back where it is joyned to the *Cerebellum*, it passeth the first hole of the bones of the Temples; it is of one soft substance, and is the proper organ of Hearing, another harder which passeth through the hole called *Cæcum* by the Ancients, slipping without the Skull between the Dug-like Process, and the Bodkin-like Appendix, and passeth to the Muscles of the Jaw, the skin both of the Jaws and Ears: Its Progress in the Ears see Chap. 16. Fig. 12.

The

The ſixt pair riſeth a little below the fifth, deſcending by the third hole of the Bone of the Temples, which is common to the hinder part of the Head, and being divided on each ſide into internal and external Branches makes that famous plexure which we ſpake of in the third Chapter.

The ſeventh pair proceeds from the Marrow juſt paſſing out of the Skull, and is harder than the reſt, and ſlips out of the Skull by the fourth and fift holes of the hinder part of the Skull; having paſſed the Skull with its common covering, it joyns its ſelf to the ſixt pair, from which being ſeparated it is diſtributed partly to the Cartilages of the *Hyois*, partly to the Tongue it ſelf, of which ſee Chapter 3. Figure 8. and Chapter 11. Figure 14. The beginnings of the Nerves and the *Glandula Pituitaria* being ſeparated out of the Cavity of the Saddle, about the Baſis of the brain, that plexure of the *Carotides* and Vertebral Arteries is to be heeded; Ancient Writers called it *Retiformis*, but Modern *Rete Mirabile*, than which, a ruder expreſſion in the brain of man admits no compariſion. Its uſe is the ſame with the *Plexus Chorois*.

The *Cerebellum* is a ſollid body if you compare it with the Brain, and is divided into two parts like Globes, between which the two Proceſſes called *Vermi formis* appear, to which about the hinder part of the Trunks of the marrow of the Back, a third is ſeen, which *Varolius* calls the Bridg of the Brain, although this be not alwaies ſimple, but ſometimes unequal with certain bunches ſticking up.

The *Cerebellum* being turned over with the Brain, and that portion of the marrow of the back annexed to it, the globes of the *Cerebellum* being gently drawn aſide, in the baſis of them appears a Cavity which the beſt *Anatomiſts* call the fourth ventricle, *Herophylus* calls it the principal ventricle, *Arantius* the *Ciſtern* : Its compaſs is round, yet ſomething broad, and diſtinguiſhed with two Cavities, at the entrance of it, where the Cavity of the marrow of the back is, the worm like proceſs hangs over it, and a thin Membrane is drawn over it, in it, the purer air drawn out of the former ventricles, is kept for the refreſhing of the animal Spirit.

The Marrow of the Back depends upon both Brain and *Cerebellum*, being but a doubled Trunk of them both, from whence it paſſeth down the large Cavities of the *Vertebræ* which ſerve like a ſheath for it, and ſends out Nerves which are diſtributed to the whol Body; it is covered with two Membranes as the brain is, but in its progreſs is of a harder ſubſtance: it hath veins and arteries diſtributed to it through the holes of the *Vertebræ* that it may be furniſhed with Blood and vital Spirit; about its beginning as we told you, it is manifeſtly divided and gives a round Cavity, which ends in a poynt by degrees, diſtinguiſhed by a ſmall chink which *Herophilus* compares to a writing pen; It is joyned by degrees in its progreſs; to external view it is ſingle, but conſidered in its ſelf it is manifold, and divided into almoſt innumerable ſmall Nerves, more or fewer, of which the Membrane encompaſſing collects into one branch, and diſtributes into pairs through ſo many holes of the *Vertebræ*.

In

In the *Vertebræ* of the Neck are seven pair, which are distributed to the Muscles of the Head Neck and Shoulders, Arms and Hands, of which in the last Chapter: The Marrow of the Back hath twelve pair, dedicated to the Membranes of the Breast, Back, and Muscles of the Ribs: The Loyns have five pair; the *Os Sacrum* six, which shall be described in the last Chapter.

Place here the first, second, and third Tables of the fourteenth Chapter, which hath the Numbers 16, 17, *and* 18. *at the corners of the braß Plates.*

CHAP. 15.

Of the EYES.

AMongst all the external Sences, the Sight carries the Prehemi-nence, which is seated in the cleer Orbs of the Eyes, which the Ancients rightly called the windows of the mind whereby it exerciseth its visible part, and the fire-brands of Love.

The Eye-lids are first of all to be viewed, which are the coverings of the Eyes, without them they have a thin skin but no fat, within they are covered with the *Pericranium*; a fleshy Membrane intercedes these, with which two Muscles which are the shutters too of the Eye-lids are intertexed, which we mentioned in the thirteenth Chapter: also the Muscle which lifts up the superior Eye-lid, which takes its beginning within the Eye, about the hole of the Optick Nerve, and being deduced from a thin and fleshy beginning, it ends in the brim of the said Eye-lid with a broad and subtil Tendon: Their extremities are Cartilaginous, which Cartilages the Greeks call *Tharsos*; for their more firm opening, and for their exact closure they have a small Muscle.

When they are open they make two angles, which the ancients called *Canthi*, the one on the outside which is less, neer which, within the compass of the Eye lies a famous *Glandula*, the internal corner is larger, within

THE FIRST TABLE OF THE FOURTEENTH CHAPTER UNFOLDED.

This Table shews, the Brain laid bare from the Skull, with the *Dura* and *Pia Mater*; also its Cavities and Processes.

FIG. I.

AA The Dura Mater *covering the Brain.*
aa The *Veins and Arteries distributed on it.*
B The *Brain covered only with the* Pia Mater.
bb The *Circumvolutions of the Brain.*
ccc The *Vessels distributed to the* Pia Mater *from the third Cavity.*
C The Dura Mater *drawn backwards.*

FIG. II.

AA The *longer Process of the* Dura Mater *called* Falx, *turned out of its Scituation.*
aa The *third cavity of the* Dura Mater *open.*
bb The *lesser inferior cavity of the same.*
BB *A portion of the callous body laid to view.*
CCCC The *brain deduced a little to the sides.*
cccc The *vessels in the fourth cavity, stretched over the callous body.*
DD The Dura Mater *hanging down on each side.*

FIG. III.

AA The *substance of the Brain.*
BB The *callous body drawn a little outwards.*
bb The *two Legs of the Vault something uncovered.*
C The *booklike process drawn backwards.*
DD The *right fore ventricle opened on the upper part.*
EE The *left fore Ventricle opened on the upper part.*
FF The Plexus Choroides.
G *Part of the* Speculum Lucidum.
HH The Dura Meninx *detracted on each side.*

FIG. IV.

AA The *brain explained by equal Section.*
B The Fornix *taken up and bowed downwards.*
CC The *superior part of the right fore ventricle deducted.*
DD The *superior part of the left fore ventricle in like manner explained.*
E The *chink designing the third Ventricle.*
FF The Dura Mater.
a The Glandula Pinealis.
bb The *Protuberances, called* Buttocks.
cc The *Protuberances called Testicles*
d The *Protuberance likned to a womans Privities. These are better expressed in the first Figure of the following Table.*

FIG. V.

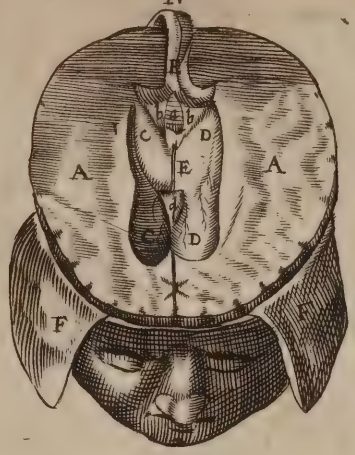
AA. BB. CC. The *brain and foremost ventricles explained in their upper part.*
f *A portion of the* Plexus Choroides *stretched upwards by the foremost ventricles*
D The *shorter process of the* Dura Mater.
EEE The *longer process thereof.*
F The Torcular *of* Herophilus.
G The Dura Mater *detracted.*
a The *first cavity of the* Dura Mater.
b The *second cavity of the* Dura Mater.
ccc The *third cavity of the* Dura Mater.
ddd The *lesser cavity in the booklike process.*
e The *fourth cavity of the* Dura Mater.

FIG. VI.

AA BB CC ff *signifie the same they did in the fist Figure.*
DD The Cerebellum *conspicuous in his natural place.*
E The *wormlike process of the* Cerebellum.
FF The Dura Mater *hanging down.*
GG The *same with the cavities rowled downwards.*

I

IV



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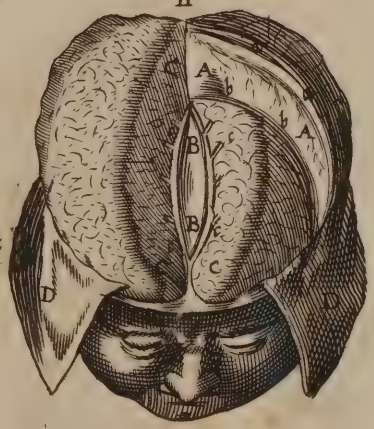

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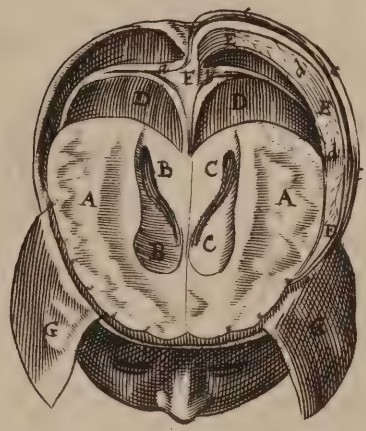

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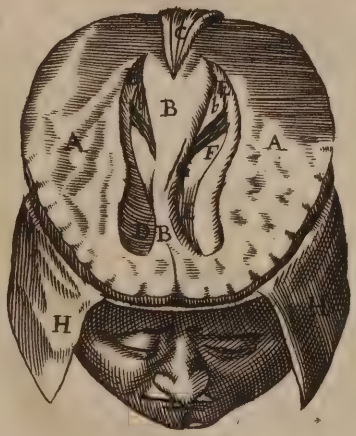


VI

16

AN EXPLANATION OF THE SECOND TABLE OF THE FOURTEENTH CHAPTER.

This Table presents in larger Figures the Cavities both of the Brain and *Cerebellum*, as they are shewed by the Dissections of the Ancients.

FIG. I.

Shews the inferior Cavity of the foremost Ventricles of the Brain, the original of the optick Nerves, the fourth Ventricle with its Protuberances, the Legs of the Vault, and whatsoever *Arantius* compared by the *Sea-horse*, or *Silk-worm*.

AAAA The Dura Mater *detracted.*
B The *Proceß of the sieve-like Bone like a crist.*
CC *Part of the* Os Sphenois, *shewing it self under the membrane, the Brain being taken away.*
DD The *foremost proceß of the* Os Sphenois, *making the Cavity of the Saddle.*
EEEE *A portion of the Brain left.*
F The *foremost leg of the Vault bowed forewards.*
GG The *hinder legs of the Vault.*
HH The *Sea-horse, or Silk-worms of* Arantius.
IIII The *inferior Cavity of the foremost ventricles.*
K The *extremity of the callous body sticking out like Buttocks.*
L The Glandula Pinealis.
MM The *Protuberances called* Testicles.
NN The *cavity between the Brain and* Cerebellum *commonly called the fourth ventricle.*
OOOO *Part of the* Plexus Chorois *bowed backwards, which is carried by the superior cavity of the ventricles.*
PP The *foremost portion of the Basis of the Brain.*
Q The *bottom of the third ventricle in which behind is the hole likned to the Fundament; it tends to the beginning of the marrow of the back; before is the hole compared to the womb, and is carried to the Funnel.*
RRRR *A portion of the* Plexus Chorois *turned backwards, which is extended to the fourth inferior cavity.*
SS The *roots of the optick Nerves.*
T The *uniting of the optick Nerves.*
VV The *optick Nerves again severed and passing towards the Eyes.*

FIG. II.

This Figure shews the proper Ventricle of the *Cerebellum*, which the best Anatomists call the fourth Ventricle.

AAAA *Each lobe of the* Cerebellum *whol.*
BBBB The *internal face of the* Cerebellum *laid open by incision.*
CC The *worm-like Proceß of the* Cerebellum *whose superior and round part is taken away.*
DD The *proper Ventricle of the* Cerebellum, *with its two cavities.*
E The *prominence conspicuous between the two cavities.*
F The *passage from the third ventricle to the marrow of the back.*
G The *Cavity of the marrow of the back like a pen.*
H The *chink in the said cavity.*
II The *descending trunk of the marrow of the back cut off.*

FIG: I.

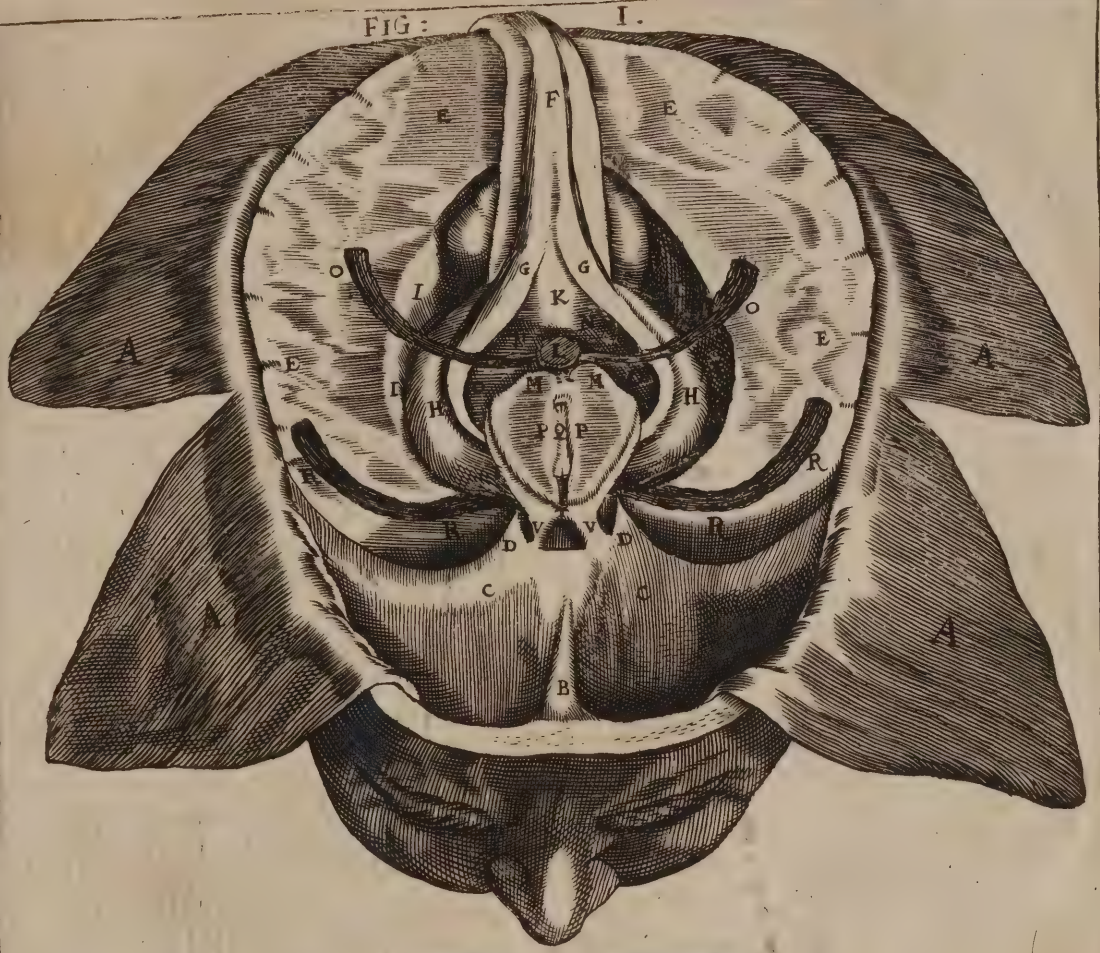
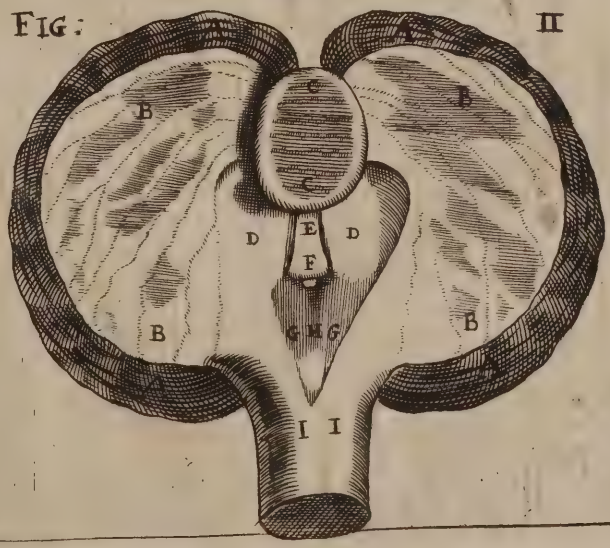
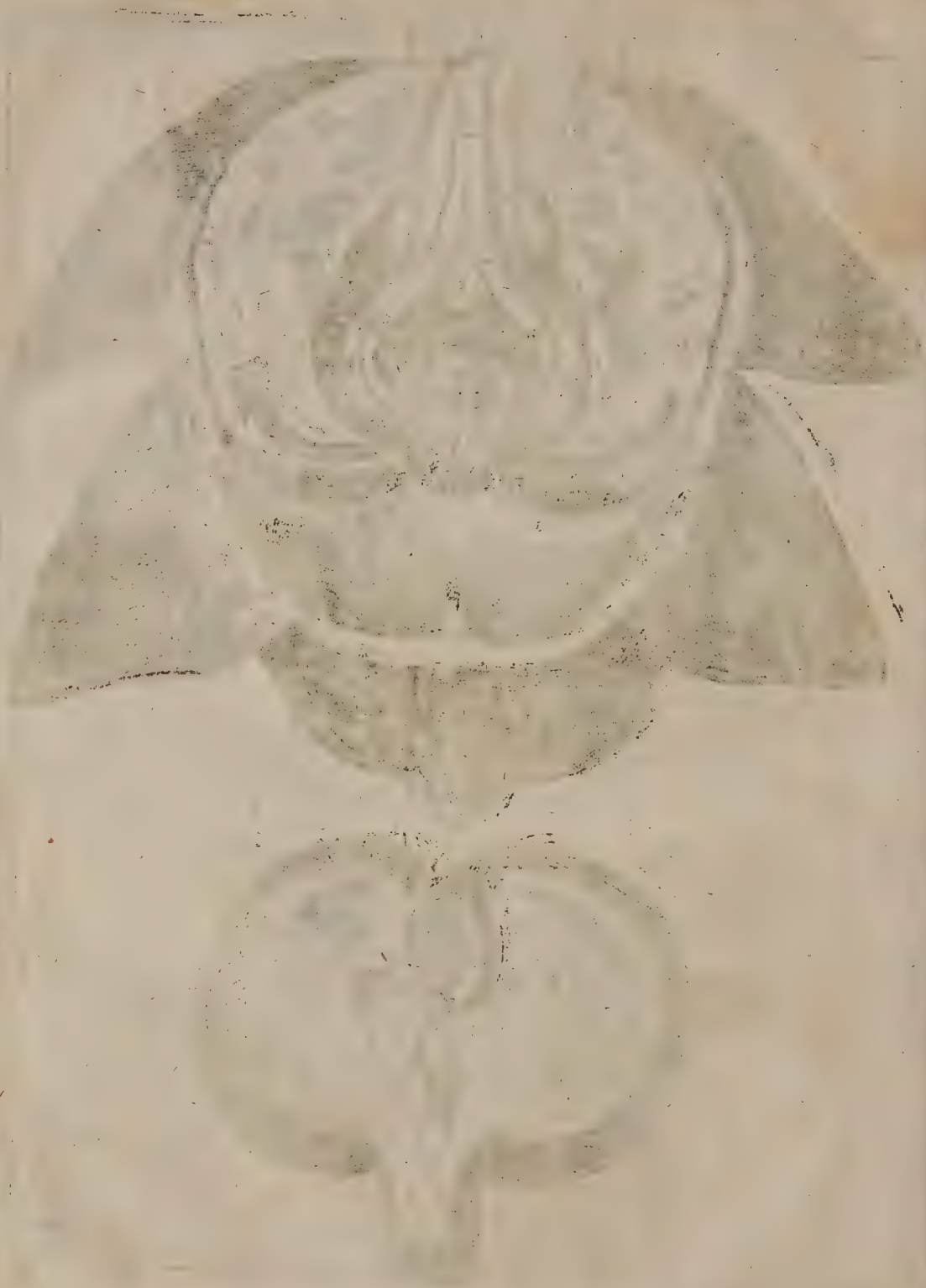


FIG: II





AN EXPLANATION OF THE THIRD TABLE OF THE FOURTEENTH CHAPTER.

This Table shews the rise of the Nerves within the Skull, also the principal branches of the third and fourth pairs, the *Glandula Pituitaria* with the Funnel, the *Rete Mirable*, the fourth Ventricle and the most special Veins arising from the marrow of the Back.

FIG. I.

Shews the Brain a great portion of it being taken away above with the *Cerebellum* diducted to the side.

A The *Nerve of smelling.*
a *Its proces called* Mamillaris.
B The *Optick Nerve or first pair.*
CC The *Nerve of the second pair.*
DD The *Nerve of the third pair.*
EE The *Nerve of the fourth pair.*
FF The *Nerve of the fist pair.*
GG The *Nerve of the sixt pair. The Nerve of the seventh pair by reason of its deep rise appears not.*

FIG. II.

The side of the skull being broken off, together with the Eye whol, and the cheek divided, is shewed.

A The *Nerve of the third pair.*
B *Its branch which goes out at the hole of the bone of the forehead.*
C *A branch of the same pair which goes out by the hole of the fourth bone of the upper Jaw.*
D The *Nerve of the fourth pair.*
E *Its branch which goes to the teeth and gums of the upper Jaw.*
F *Its branch which is carried to the Tongue.*
G *Its branch which enters the lower Jaw.*
H The *same branch which passeth out at the hole of the lower Jaw.*

FIG. III.

The Brain with the Marrow of the back being turned, these things come to view.

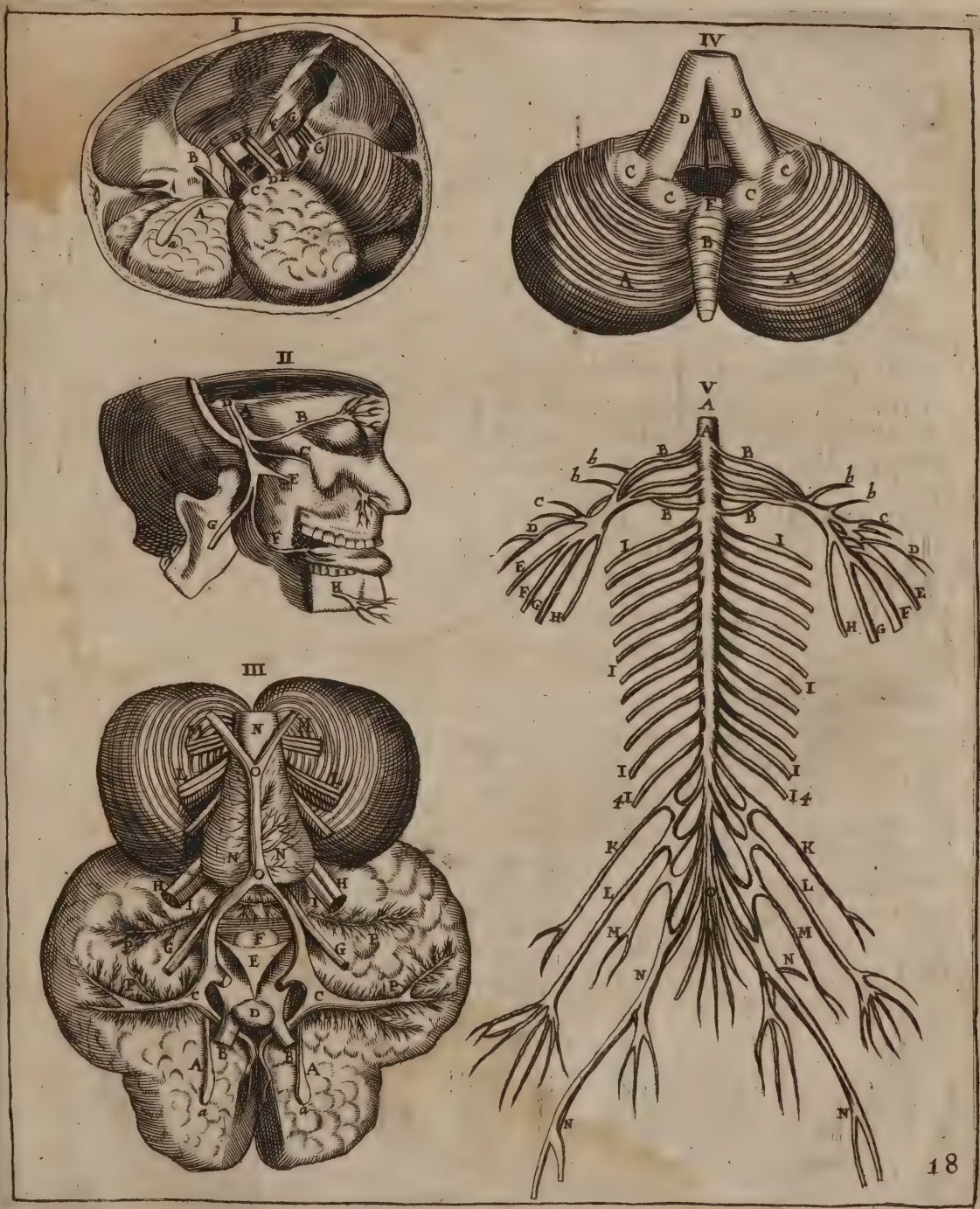
AA The *Nerves of swelling.*
aa *Their Dug-like processes.*
BB The *two legs of the Nerves of the first pair.*
CC The *greater branch of the Artery* Carotis, *the interior being joyned to the Vertebral Artery OO*
D The Glandula Pituataria.
E The *Funnel.*
F The *Protuberances of the Brain, set before the passage which carries the flegm to the Funnel.*
GG The *Nerves of the second pair cut off.*
HH The *beginnings of the Nervs of the third pair.*
II The *beginning of the Nervs of the fourth pair.*
KK The *beginning of the Nerves of the fift pair.*
LL The *beginning of the Nervs of the sixt pair.*
MM The *beginning of the Nervs of the seventh pair*
NNN The *beginning of the marrow of the back, between the skull and the first* Vertebra.
OO The *common branch of the Vertebral artery, which being divided after its union with the* Carotis *artery CC makes up the* Rete mirabile *with it, about the seat of the Wedg-like bone.*
PPPP *Smal branches of Arteries called the* Rete mirabile.

FIG. IV.

AA The Cerebellum *and his globes.*
B The *wormlike proces of the* Cerebellum.
CCCC The *proces of the* Cerebellum, *called the bridg.*
DD The *beginning of the marrow of the back.*
E The *cavity of the marrow of the back, called the pen.*
F The *fourth Ventricle laid open.*

FIG. V.

A The *trunk of the marrow of the back descending as it may be publickly shewed being taken out of the body.*
BB The *branches arising from the three pairs of Nerves of the Neck, and two of the Breast, to be distributed to the hands.*
bb The *small branches running to the muscles of the shoulder.*
CC The *first pair of Nerves of the hands.*
DD The *second pair.*
EE The *third pair.*
FF The *fourth pair.*
GG The *fift pair.*
HH The *sixt pair called* Subcutaneus.
IIII The *pairs of intercostal Nerves, the two lowermost of which pertain to the Loyns.*
K The *first pair which is carried to the Foot.*
LL The *second pair.*
MM The *third pair.*
NN The *fourth and greatest pair.*
O The *smal Nervs of the marrow of the back, which are carried to the bladder and muscles of the Fundament, and to the Genitals of both Sexes.*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within which lies a ſpongy Caruncle, and ſoft, neer the Bone of the Noſe, which ſtops the flowing of tears by the Noſtrils, and for that very cauſe is called *Lacrymalis*; in the Cartilaginous brims of the Eye-lids, about the greater angle are two ſmall holes, a callous lightly hanging over them, which are called *Puncta Lacrimalia*, becauſe if you put a Hogs briſtle into them they produce tears, they are moſt conſpicuous in great Beaſts, and Men that are prone to weep. But how comes it to paſs you will ſay that tears are ſo rife and ready in time of grief? Truly, not from the Eyes, but from the Brain, by the ſecond hole of the wedg-like bone, alſo from the top and ſides of the Head they flow to the forementioned holes; hence it comes to paſs that the ſkin between the external angle of the Eye, and the *Helice* of the Ear, together with the paniele under it being wounded, much watry ſubſtance iſſues out, and continual weeping againſt ones will inſtantly ceaſeth.

To the extremity of the Eye-lids are hairs inſerted, growing out ſtraight, and when they are grown to their natural length, ceaſe growing; theſe not only keep ſmall bodges which fly in the air from getting into the Eye, but alſo by giving a gentle ſhadow they make the ſight the more piercing; but this famous uſe is loſt ſo often as theſe hairs are thicker than naturally they ſhould be, and when they are turned inward and prick the Eyes.

The office of the Eye-lids is conſpicuous, *Viz.* to moiſten the Eyes, to open, ſhut and defend them, and their office is of ſo great neceſſity Nature will perform, when we are ſo far from willing of it, that we never think of it, for it is very rare to forbear winking when any thing threatens.

To the confines of the Eyes and Forehead, hath the Divine Creator produced the Eye-brows, being a thick ſkin ſticking out, and rough with hair, not ſo much for beauty ſake and to ſhadow the Eye, as to keep the ſweat which falls down from the Forehead out of them.

But the Eyes themſelves which are the organs of Sight, are variouſly furniſhed with veſſels, Muſcles, Membranes and Humors: of the Veins ſome are external and viſible on the white of the Eye, other ſome are internal and hidden; the external veins proceed from the external branches of the Jugulars; the internal, which accompany the optick Nerve from the internal Jugulars, and are helped by the *Plexus Choroides*. The original of the Arteries is not unlike this, the interior of which ariſe from the exterior Branch of the *Carotides*; the internal come from the *Carotides*, where with the Vertebrals they make the *Rete Mirabile*; hence it comes to paſs that in external provocations the blood being mingled with Spirit the Eyes look red, and ſometimes are inflamed: they have diverſe Nerves, the moſt famous of which, is the Optick Nerve, which carries the viſive vertue to the Eye, and by its expanſion, or opening abroad of its own ſubſtance, ſeems to beſtow a three-fold Tunicle upon the Eyes; the next to this is leſs, which with the two ſmall Nerves its companions, diſtributes its Branches to the two Muſcles of the Eyes, which are called *Motorii* from their office, which we diſcourſed of in the foregoing Chapter.

The bigneſs of the Eyes in a Man grown up is mean; in number they are two, that ſo when the one is hurt the common office might be performed by the other, and yet their conſent is admirable, ſo that the one being hurt by internal cauſes againſt Nature, the other is hurt alſo, or elſe grows weaker, or is blood-ſhot. If we look upon their qualities by reaſon of their contained humors, they are cold and moiſt, and yet this is wonderfully leſned by the copious influx of heat and Spirits, by ſo many veſſels, whereby waxing hotter than a natural mean, they not only infect Looking-glaſſes being held neer them, but alſo other mens Eyes with the ſame diſtemper.

Nay, the Eyes have light in themſelves, and a certain Splendor not only in the humors but alſo in the Membranes; indeed this is but mean in Man, becauſe the actions God hath ordained for him are to be performed in the day time, but it is greater in ſuch living creatures as get their food by night, the inbred light of whoſe Eyes overcomes the darkneſs round about them; there is ſcarce another part of mans Body that gives more manifeſt ſigns of health and ſickneſs than the Eyes do: In a man that is in health, they are full and bright; in a Man that is ill, they are ſunk, ſad, troubled, or obſcure, till death hath overcome Nature, that they fail in ſtrength and ſight, and give warning of changing this life for another. Laſtly, Conſider that the Ancients were perſwaded that the whol force of the mind was inſiſted in the Eyes, and that there was no Beaſt ſo fierce, but if his Eyes were covered would be milder.

Their figure ought to be round, not ſo much that they might move the eaſier, as that they might receive viſible objects the better; they carry the ſame form the Stars do, that by them we may meaſure their riſing and ſitting, and therefore it was a cuſtom amongſt the ancient *Romans*, to carry men that were neer death out into the air that they might behold the Heavens: The wiſe Creator hath placed them in a high and ſtrong hole of the Skull; high, that they might perform their office of watchfulneſs the better, and ſtrong amongſt the Bones that they might be the better defended from wrong.

But that we may the better know their actions, we will view, firſt their Muſcles, then their Membranes, and laſt of all, their Humors; the Muſcles which move the Eyes of Man, are ſix in number, which have fat about them to defend them from the injury of coldneſs and drineſs: Of theſe, ſuch are called *Recti* as perform the right motions of the Eyes; ſome are called Oblique, whoſe magnitude and thickneſs is almoſt equal with the right; they take their beginning from that internal bone, about the large holes which admit the Nerves, and are carried under that Tunicle called *Annata*, to that which is called *Cornea*; theſe are four in number, of which, the firſt lifts up the Eye, and is called *Superbus*, becauſe proud people uſually go with their Eyes elevated: The next oppoſite to the firſt depreſſeth the Eye, which action becauſe it is a note of modeſty, the Muſcle is called *Humilis*: The third draweth the Eye right to the inner angle, and is called *Bibitorius*, becauſe when people drink they turn their Eyes inward that they may look in the Cup: The fourth

fourth draws the Eye to the external angle, and is called *Indignatorius*, becauſe men lear on that faſhion when they are angery; theſe are the right Muſcles.

The Oblique Muſcles are two, and are called *Amatorii*, becauſe the glances of the Eyes intice Lovers; Of theſe, that which is leſs and inferior in Scituation, riſeth in that place; the firſt Bone of the Jaw, is joyned to the fourth in extream part of the inferior *Orbita*. It aſcends obliquely upwards towards the outward angle of the Eye-lid, and paſſeth with a ſhort Tendon to the *Iris*, and turns the Eye obliquely downwards, towards the outward angle; the other oblique Muſcle which is called the greater, is longer and higher in Scituation, and hath the ſame beginning with the third of the right Muſcles, neer the internal angle of the Eye, it enters the Cartilaginous *Trochlea*, with a thin beginning, from whence paſſing obliquely, by the ſuperior part of the Eye, it ends neer the end of the oblique Tendon of the inferior Muſcle, and turns the Eye about towards the internal angle.

The Membranes which include the Eye are common and proper; The firſt of the common is called *Adnata* or *Conjunctiva*, neither is it any thing elſe than the *Pericranium*, ſpread abroad to the Eye-lids, and white of the Eye. The other is called *Innominata*, and ſeems to be nothing elſe but a ſubtil expanſion of the Tendons and Muſcles, eſpecially the right ones, and is produced to the circumference of the *Iris* or *Cornea Membrana*.

The firſt of the proper Membranes is called *Sclerotes*, or hard, by reaſon of its thickneſs and habit; on the fore part which is tranſparent it is called *Cornea*, becauſe in cleerneſs it reſembles a thin Horn; it ſticks ſomething out on the fore part.

The ſecond of the proper Membranes is called *Uvea*; on the fore part it is far thinner than the former, and hath diverſe colours, behind it hath a certain black ſinootineſs; that this is requiſite for the more perfection of ſight, is probable by this Argument, Becauſe in the *Embrion* in the Womb, even before the Eys are cover'd w^th^ the Eye-lids, it is produced by Nature of a blackiſh color, manifeſting it ſelf through the *Scelotes*; that portion of it which is tranſparent through the *Cornea*, is called *Iris*, by reaſon of its variety of colours; it hath a manifeſt hole in it called *Pupilla*, through which, as through a window, it diſcerns the Species of viſible objects: It is free from any nexure both before and behind, notwithſtanding in the Circumference of the *Cornea*; being firmly joyned to the bounds of the *Sclerotes*, it makes that Ligament which Authors call *Ciliare*, from which according to the latitude of the *Uvea*, towards the Chriſtalline humor, certain ſmall ſtrings run like black lines, like the hair of the Eye-lids; by their help the hole of the *Uvea*, is contracted and dilated, and the Chriſtalline humor it ſelf ſuffers gentle motion.

The remaining and greater part of the ſecond Membrane, which compaſſeth about the hinder part, and ſides of the Eye, and where it is knit to the *Sclerotes* is called *Choroides*, both becauſe it compaſſeth the Eye, and becauſe it is endewed with not a few ſmal veins; and as the Al-wiſe Creator made the Corneal Tunicle cleer, that ſo the viſible object might

touch the internal or illuminated part of the Eyes, so he made the second Membrane opacous, that the visible Image being received into the Eye, might be the more cleer by the shadow round about it.

The third of the Membranes is called *Retiformis*, or *Amphiblestroides*; It is soft and of a Mucous substance; it obtained its name, because being put into the water it is like a little Net: It is stretched from the very centre of the Optick Nerve above the vital humor, even to the Ciliar Ligament.

The fourth Membrane is called *Christalina*, and compasseth the Chrystalline humor before, and is as thin as a Cobweb, and was therefore called *Aranea*.

The fift and last Membrane is called, *Vitrea*, embracing the Vitreal Humor, famous both for its lightness and thinness; in the Eyes of Living Creatures being made thick by a gentle boyling, both this and the former may be discerned from the humor they contain in them.

The Humors of the Eyes come now in play, which are in number three; the *Aqueal*, *Chrystalline*, and *Vitreal*; all of them cleer and void of any colour, that the Idea of visible things which have colours may be the better discerned.

Of the Humors, the Aqueal is the first, thinnest, and most fluid, moistning the Christalline humor, and that part of the Vitreal which is next it; it is distributed as well within as without the Uveal Membrane: It is gathered before within the *Cornea*, behind by the Christalline and Vitreal Tunicle, and comprehended with the Ciliar Ligament.

The Christalline humor excels the rest by far in soliddity, cleerness, and splendor: It is produced by Nature from a cleer portion of the Seed, and makes the very Fundamental of the Eyes, so that they err that think it to be void of heat and spirit, and also of true nourishment, for its original is of Seed, and it encreaseth like other parts: It is in form like a little lentil, of a compressed roundness, in what part it looks towards the *Pupilla*, and is next the Aqueal humor; that side of it which lies in the Cavity of the Vitreal humor, is beheld in a longer Sphear; neither is this alwaies so, for sometimes the fore part is most globous, the hinder part more obtuse, and sometimes both sides are alike: It is placed in the midst of the Eye, yet so as it sticks out most on the fore side.

The Vitreal humor is greater than the other two, and is like melted glass, not only in substance, but also in bright colour; it occupies all the Cavity of the Eye that is left by the other two; behind, and on both sides it is round; before, it hath a Cavity, in which is placed the Christalline humor.

The action of the Eyes is Sight; in which, if you regard the expression of the visible Species within the Eye, the Christalline Humor hath the preheminence: If you regard the sensibility of this expression, then the optick Nerve and the expansion of it by the Net-like Tunicle hath the preheminence.

Also

AN EXPLANATION OF THE TABLE OF THE FIFTEENTH CHAPTER.

This Table comprehends the Eye-lids with the Muscle called *Levator*; also the proper Muscles of the Eyes; the Membranes and the Humors included in the Membranes.

FIG. I.

AA The Levator *muscle of the superior Eye-lid.*
B *Its tendon thinly opened.*
CC *The Cartilages of the Eye-lids.*
DD *The Caruncle in the internal angle.*
dd The Puncta Lacrymalia.
E *The external angle of the Eye-lid.*

FIG. II.

AA *The Fat behind the Eyes.*
BBB *The muscles of the Eyes not separated.*
CC *Part of the Eye covered with the tendons of the muscles.*

FIG. III.

A *The right muscle lifting up the Eye.*
aaa &c. *Small Nerves carrying motion, sence, and spirit.*
B *The right muscle depressing the Eye.*
C *The right muscle drawing to the Eye.*
D *The right muscle drawing the Eye from.*
E *The inferior oblique muscle, whose tendon is but only separated from the part of that which follows.*
F *The superior oblick muscle.*
G *The* Trochlea *of the same muscle.*
H *The* Sclerotes *covering the hinder part of the Eye.*
II *A portion of the Optick Nerve inserted into the Eye.*

FIG. IV.

Shews a Sheeps Eye, and in it the seventh muscle which Man needs not.

A B C D *The four right muscles.*
E *The inferior oblick muscle, which here is large.*
F *The superior oblick muscle which is slender.*
G *The* Trochlea *of the superior oblick muscle.*
H *The seventh muscle of Brutes drawing the Eye to.*
I *The hinder part of the Eye covered with the tendon of the seventh muscle.*
K *A part of the optick Nerve included in the seventh muscle.*

FIG. V.

A B C D *Shew the same with the former, the oblick muscles being removed.*
aaaa *The common membrane called* Innominata.
bb *The* Iris *transparent through the* Cornea.

FIG. VI.

AAA *The Membrane* Sclerotes *dissected.*
B *The* Membrana Cornea.
C *A part of the optick Nerve.*

FIG. VII.

A *The* Membrana Uvea.
a *The hole in the* Uvea *or* Pupilla.
BB *The Ciliar Ligament with its strings.*
CC *The* Membrana Choroides *looking black.*

FIG. VIII.

AA *The Net-like Membrane.*
aa *A Rupture in it upon the Vitrial, which by reason of its softness is unavoidable in a Dissection.*
BBB *The* Membrana Choroides *not yet separated.*
CCC *The thickness of the Membrane* Sclerotes.
D *Part of the optick Nerve.*

FIG. IX.

The three humors of the Eyes received in a Vessel.

A *The Crystalline Humor posited in the Cavity of the Vitrial.*
BB *Some appearance of the Ciliar strings.*
CC *The Vitrial humor.*
DD *The aqueal humor, being but little, and placed round about the Vitrial.*


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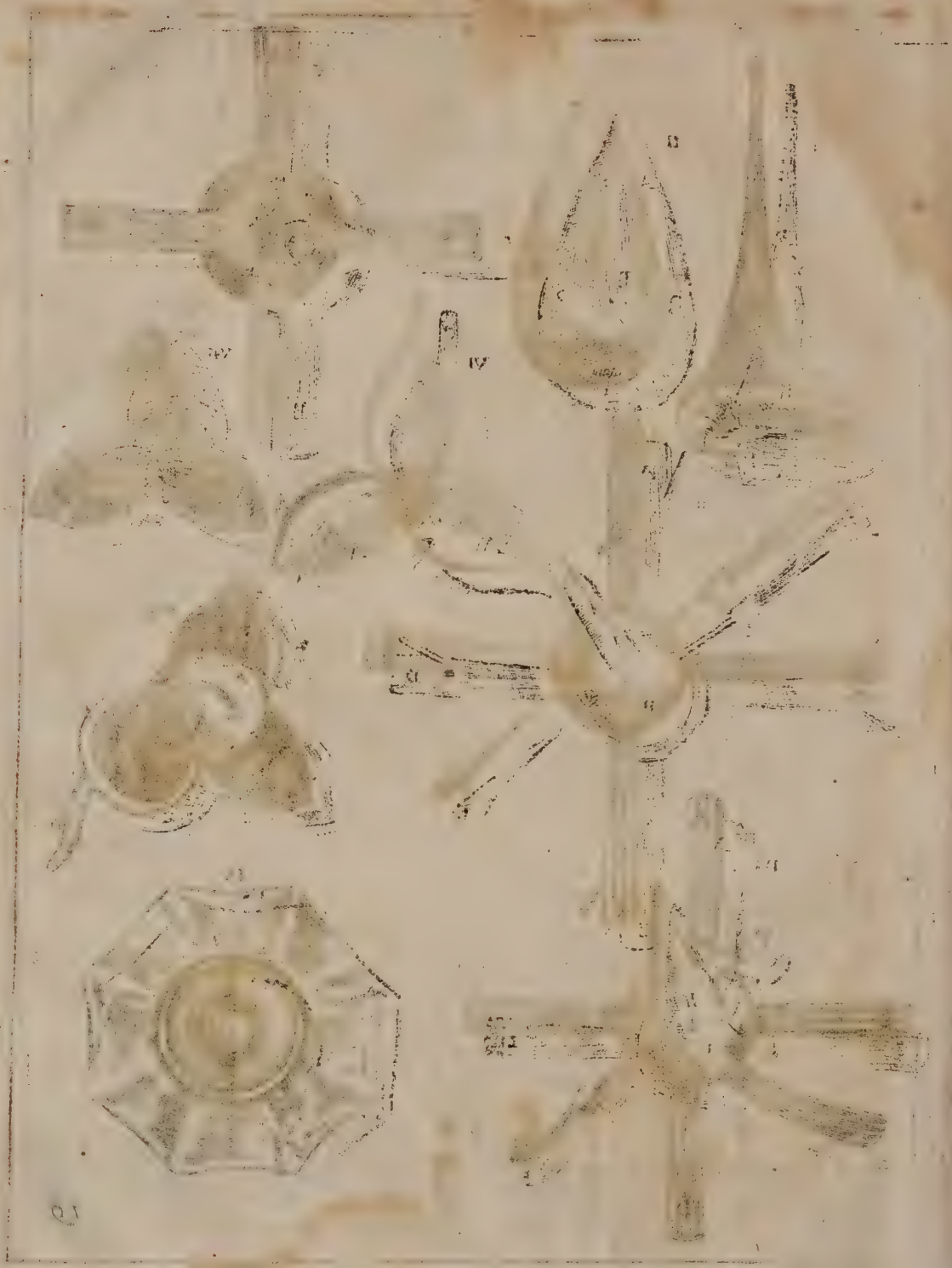

Alſo it ought to be doubtful to none, that the Eyes are the procurers of love, for not only colours, but the univerſal figure and Harmony of things is committed to them by the Mind, and the Grace and Beauty attending them.

Place here the Table of the fifteenth Chapter, which hath the Number 19. at the corner of the braſs Plate.

CHAP. 16.

Of the EARES.

EVen as the Eyes conduce to the pleaſure of the life of Mortals, for the uſe of the light, and are therefore moſt precious parts of the Body, Even ſo the Organs of Hearing are excellent for the learning of Wiſdom and Diſcipline: Of theſe, ſome parts are manifeſt to the Eyes, and others hidden within the holes of the *Os Petroſum.*

The manifeſt part of this Organ they call the Ear, *Auricula*, and more diſtinctly the external Ear: This conſiſts of diverſe parts, of ſkin, ſome ſmall fat, and a fleſhy Membrane underneath, but properly of a Cartilage, a lobe, and private veſſels: The Cartilage is the uppermoſt and largeſt portion of the external Ear, that the paſſage of Hearing may be kept open night and day: Its Cavities and Productions are not eaſily beaten out of play, for by their ſoft bowing, they yeild to the Head when it lies down, and to other external things, but eſpecially they force the ſound they receive ſtrongly inwards.

A ſoft ſubſtance occupies the inferior part which is called *Lobus*; it is more like fat than fleſh, and in this, being pierced through, people wear Jewels: Women in old time uſed to lay out more coſt in nothing than in Pearls to hang in their Ears; neither are the *Arabian* Women leſs mad who hang huge Rings there, and hold it a grace alſo to wear ſuch in the ſides of their Noſes.

These parts have Veins from the external and internal Jugulars, Arteries from each *Carotis* and two Nerves, produced especially from the second pair of the marrow of the Neck, to which a small branch is to be added from the hard portion of the fift pair, which passeth by the hole called *Cæcum*, and these creep along the sides and lower part of the Ear.

Nay, least any thing should be wanting to the perfection of this noble Sence in Man, the Divine *Creator* hath placed two Muscles about the Cartilage we spake of, which for their singular thinness *Galen* calls *Perigraphius* or Linaments of Muscles, expressed in the Membrane under the fat, with a Fleshy fibrous intertexture, sometimes more plainly, sometimes more obscurely, that that being stretched out, so often as we would hearken attentively, and the lower part of the Ear being gently drawn back; by the help of these Muscles it passes more directly to the Membrane of the *Timpanum*: Of these, that which moves the Cartilage upwards and forwards, being placed upon the temporal Muscle, descends next the external beginning of the Muscle of the Forehead, and growing narrower by degrees; it ends in the Ear, in the upper part of it: Those which move the Ear obliquely upwards and backwards, are held to be five; amongst which, most commonly with that which went before, that is numbred, arising from the Muscles of the hinder part of the Head, passeth Transversly downwards above the Dug-like process, and sticks to the root of the Cartilage, sometimes with two, sometimes with three distinct Tendons.

The magnitude of the external Ear of Man is but small, and easily covered with the Hair: In respect of its disposition, it is cold and dry: In figure it is almost oval, yet not without various protuberances, of which that w^ch^ makes the extream brim of it for its wreathed flexure is called *Helix*, the next which is inner and answers to the first is called *Anthelix*: the eminences which behold the Temples and are rougheſt with hairs, in some they have a thick tuft like a Goats beard, is called *Tragus*, and that opposite to it *Antitragus*. The Cavities of the Ears are three, the one interior, which is the Portal of the passage of Hearing; the other is drawn about this, and from its similitude to a Shell, called *Concha*: between the *Helix* and *Anthelix*, is a third comprehended, for which, Authors are yet to seek of a name. The most wise Creator hath placed the ears in the upper part of the Body, because the air sooneſt carries sounds upwards: The Cartilage is joyned to the *Os Petrosum* by a strong Ligament, which is produced from the *Pericranium*; the rest is joyned to the Body by the Tendons of the Muscles, and the common coverings.

The use of the Ears is not the ornament of the Head, nor yet to hang Jewels in, although Nature hath left certain footsteps of a hole in each *Lobus*, nor yet the defence of the Brain which is sufficiently defended by its own proper muniments, but that the aerial sound being collected and received by so many Cavities, may more directly pass to the internal Caverns of the Ear, and therefore although this external Ear be wanting in very many living Creatures, yet it is palpable by this, that in man it conduceth to the perfection of hearing, because such as have lost their

Ears

Ears (not for their honesty) or have them mutilated by cold, or the Cavities stoppped whereby detriment comes to the hearing, they remedy it by holding the Cavity of their Hand over their Ear.

These are very many *Glandulæ* about the Ear, which drink up the redundant humor, and underprop the vessels, which *Hippocrates* by reason of their neerness, calls *Parotides.*

But that internal and true Organ of Hearing, is placed in the rocky Process of the Bone of the Temples, being not only safe by reason of its hardness, against the violence of external injuries, but also the fitter to retain the sound by reason of its dryness : Its Cavities and turnings are very many; four are especially related by the Authors of Dissections which have relation to the use of Hearing, namely the passage of Hearing, *Timpanum*, *Labyrinthus*, and *Cochlea.*

The passage of Hearing beginning from the *Concha* of the external Ear, is cloathed with a thin skin and a Membrane with some fat, and with the *Pericranium*, even to the borders of the *Timpanum*: It hath a wreathed passage turning something upwards, that so things which outwardly fall into it, may not come to the *Timpanum*, and corruption gathered within it may the readier be carried out: In the passage of hearing is a viscous humor gathered, yellowish in colour and bitterish in tast, which is a present remedy for wounds and ulcers; the Ancients called it *Cerumen*, and the place it self in which it is found the *Hive* of the Ears, and we in *England* call it *Ear-wax* : It hath its use, for such things as creep into the Ears, are intangled in it, as it were in *Bird-lime*, and so offended with its bitterness that they cannot pass to the *Timpanum.* In the end of the passage of Hearing is a Membrane, which the Ancient Greeks called by the common Name *Meninge*, or the *Lymen* of the Ear, but Modern Anatomists, by reason of that eminent Cavity which is neer it, call it the Membrane of the *Timpanum*; it is the internal covering of the Ear and very thin, yet by reason of its singular clammineſs, it is a Nervous Ligament firm enough, that it not only sustains the external force of the air without any prejudice, but by its drineſs preserves the Species of the sound, and sends it into the internal Cavities of the Ear; it seems to be but an expansion of the *Periostion*, which being separated, that is separated also; it is exquisite in sence, both by reason of the Nerves that are distributed in it, and that pass under it, sometimes it is double, and many times the excrements being thick and sticking to it like a crust, brings no small prejudice to the Hearing: It looks down right from an oblique Scituation, whereby it is safer from outward violence, and apter to receive the image of voyce; it sticks firmly to the little bone which is called *Mullens*, and to the Cavity of the *Orbita* next to it, if you except but that part which toucheth the superior region of the passage of Hearing, for there the connexion is looser, so that the Membrane may be a little opened.

For in the superier and internal Cavity of the passage of Hearing, the provident Creator hath placed a Muscle intertexed with the Membrane growing to the skin, and this is seen not only in men grown up, but also continually in Infants, which here by its thin substance of fleshy *fibræ* growing

growing narrower from a broad beginning, with a ſubtil Tendon touching the Membrane of the *Timpanum*, is carried even to the *Malleolus*, that the Membrane being ſtretched a little outwards and upwards towards the ſuperior part, the ſound may be the righter taken and the better conveied to the innermoſt part of the Ear.

This Membrane being taken away, a large Cavity appears, which *Hippocrates* rightly calls *Antroſa*, by reaſon of the various Cavities into which it is diffuſed: *Fallopius* calls it *Timpanum*, becauſe the Membrane is placed round about the edges of it, like a Drum-head: He that would view this accuratly, muſt firſt take away the three ſmall bones placed in it; they are diſtitute of Membranes, and yet about their extremities, they are bound with a ſlender Ligament for their firmer nexure, the firſt of theſe from the likeneſs of its form they call *Malleolus*, it hath a round head from which by degrees it is attenuated, about the middle it is adorned with two proceſſes, one of which is ſhort, to which the internal Muſcle joyns it ſelf; the other is longer but thinner, which lies upon the roundneſs of the *Timpanum*, the remainder of the little bone whether you compare it to a little foot or to a tail, its extremity being a little turned inwards, lightly turns the Membrane ſticking to it, about the middle; its head is joyned to the *Anvil* placed to it, by ſuch a nexure as is not very ſtraight by reaſon of the looſneſs of the Ligament: It is more ſtrongly joyned to the Membrane under it, for the ſafeguard and motion of which, the *Moleolus* is framed.

But ſeeing that to the exquiſite tranſmiſſion of ſound, it is not ſufficient to unfold the Membrane of the *Timpanum*, a little outwards, but alſo to conſider the reſt of the Dimenſions; The wiſe Creator hath produced a Muſcle, which is very little, but in exactneſs of all parts equal with the greateſt, and hath ſecured it in a ſingular paſſage of the *Os Petroſum*: It takes its beginning like a Ligament, at what part the ſtony proceſs is joyned to the Wedg-like Bone, and growing thicker by degrees, it paſſeth commonly with a double, ſometimes with a ſingle Tendon, to the ſhorter proceſs of the *Malleolus* and its Neck, and therefore the bone being moved inwards toward the forepart, it draws the Membrane of the *Timpanum*, which is annexed to it inwards alſo.

The other of the little Bones of Hearing, obtains the name of *Anvil*, and is of a thicker body; this hath a light Cavity, in which, the head of the *Malleolus* is received; as alſo two Proceſſes, of which, the ſhorter leans to the hinder Cavity of the *Timpanum*, the other is longer, and is firmly, though looſly, bound by a Ligament to the head of the *Stirrop*.

Alſo the third ſmall Bone of the *Timpanum* is called *Stapes*, or a *Stirrop*, from its figure, it hath a round head, which, as we told you, was knit to the *Anvill*, it ſtretcheth out from its head two Cavities, and a little log bowed like a bow, with a very thin and porous Baſis, leaſt any thing ſhould ſtop the paſſage of the ſound; this anſwers in likeneſs to the circumferen ce of of the oval hole, to which it is bound with a looſe bond, ſo that it may be driven within its Cavity but cannot be pulled out without violence, and theſe two ſmall bones are formed for the *Malleolus* ſake

that

that they may conveniently underprop it and be obſervant to its motions. To the Stirrop is added a fourth little bone, round and ſmall, annexed to the Ligament of the *Stirrop*, which *Francis Sylvius* is ſaid firſt to have found out.

Now the Cavity it ſelf which is called *Timpanum* comes to view, and preſents a various face to them that behold it, for it hath many Cavities and turnings, in which the violent conflux of air is diverted, and the reflexion of the voyce hindred by its ſingular inequality; alſo it hath diverſe pores and paſſages which tranſmit the images of ſounds: above, where the ſhorter Proceſs of the *Anvil* is, a large Den is opened, which by its ſmal Caverns opens a way into the inexplicable hollowneſs of the Dug-like Proceſs: Beneath, and toward the fore part, there is a paſſage from the *Timpanum* to the Pallat, w^ch^ is narrower toward the end by reaſon of the acceſs of Cartilages, by which the ſound being as it were ſtirred up in the mouth with the air, paſſeth to the Ear, ſo alſo the humidities againſt Nature are caſt out by the pallat, and that is the reaſon ſuch as are dull of hearing, hear better their mouths being open, and breathing reſtrained, but when they yawn they are altogether deaf; and although the outward Ear be altogether ſtopped, yet they percive their own ſpeech well enough; neither can any other reaſon be given, why the mouth and noſtrils being ſtopped that *Membrana* of the *Timpanum* is turned outward with a ſound, and if the violence be the greater it is hurt by it, and by this paſſage ſome will avoid the ſmoke of *Tobacco* which they take, out at their Ears: Alſo *Alcmæon* held that Goats alſo breathed by their Ears, the air and what is mixed with it, ſo readily running from the Pallat to the *Timpanum*.

The middle of the antrous Cavity which ſticks up like a little ſmooth hill, hath a hole on each ſide, of which, that which is greateſt and ſhut with the thin and cleer Baſis of the *Stirrop*, they call the *Oval window*; that which is leſs they call rhe *Round window*; the one deduceth the ſound to the labirinth, the other to the beginning of the *Cochlea*; at the end of this, more ſmall pores are ſeen.

The oval Window looks into another Cavity far leſs than the former, which by reaſon of its bony paſſages returning into the ſame Cavity, *Fallopius* calls the *Labyrinth*; its compaſs is round, and beſides that oval hole which is over it, it hath four holes of its own which end in periods, and a fift which opens it ſelf in the end of the broader circle of the *Cochlea:* Theſe the following Table ſufficiently manifeſteth, but the *Labyrinth* whol with its circles and the *Cochlea*, the Table of the eight Chapter in the ſecond, ſeventh, and eight Figure repreſents.

The *Cochlea* is a famous Cavity of the Ear, with two circles and a third portion bowed like a ſpoon; it is placed in the common rocky proceſs, it is ſpermatical, dry, and light, of a ſubſtance fit to preſerve the ſound.

In theſe abſtruſe Cavities air is contained even from the very birth; to this hidden Organ of Hearing are ſmall Veins and Arteries diſtributed from the internal and foremoſt branches of the Jugular Vein and *Carotis* Artery, but eſpecially Nerves; for whereas a double portion of the fift

pair is carried into the posterior passage of the *Os Petrosum*, or first hole of the Bone of the Temples, one is harder, which enters the hole called by the Ancients *Cæcum*, and passeth the Skul, by a wreathed passage; the other is softer and divided from the former by a process in the bony passage, this passeth by its greater part to the Centre of the *Cochlea*, by its lesser to the circles of the *Labyrinth*; in both places it perfects the office of hearing: to these a singular branch from the fourth Conjugation adds its self, and passeth to the *Timpanum*, from the internal part of the Ear, from whence passing out it divides its self and partly joyns it self to the harder portion of the fift pair, partly it is distributed to the Caverns of the Dug like Process.

From this the Membranes have sence, and the internal Muscle its motion, but in this part of the Organ of Hearing, if it be demanded which is chiefest and most necessary to hearing, we must make some distinction, for if we regard that part which retains the sound, and sends it to the internal parts, the *Cochlea* will gain the preheminence, but if we search after what is required to the perceiving of the sound received, the expansion of the soft Nerve placed in the circulation of the *Cochlea* will have the dignity.

After the Sences of Seeing and Hearing, there is no reason we should treat of the Organs of Smelling, Tasting, and Feeling, for the Nostrils are the Instruments of Smelling, the Bones and Muscles of which we treated of in the thirteeth Chapter, especially of the Nerves of Smelling in the fourteenth Chapter. The Tongue is the Organ of Tasting, of whose substance, Muscles, and Vessels, we writ copiously in the eleventh Chapter: The Feeling is common to all the parts that have Nerves, or their Branches or Membranes, and hath no particular Organ of its own.

Place here the Table of the sixteenth Chapter, which hath the Number 20. *at the corner of the brass Plate.*

CHAP.

AN EXPLANATION of the TABLE of the sixteenth CHAPTER.

This Table represents the external Ear with his Muscles and Cartilages, as also the internal or chief Organ of Hearing, its Cavities, Bones, Passages and Nerves, as they are found out by Dissection of such Bodies as are grown up.

FIG. I.

Shews the external Ear whol, with its muscles and Cavities.

AA The Helix *of the Ear.*
BB The Anthelix.
C The Tragus, *or beard of the Ear.*
D The Antitragus.
E The *external lobe of the Ear.*
FF The *external* Concha *of the Ear.*
GG The *cavity between the* Helices *called* Innominata.
H The *muscle moving the Ear right upwards.*
III The *three-fold muscle with his tendon moving the Ear oblickly upwards, divided into so many parts.*

FIG. II.

Shews the external Ear conspicuous behind.

AA The *skin with the Membrane stretched upwards and downwards.*
BB The *Cartilage which makes the Ear.*
C The *hole for the passage of hearing.*
D *A portion of the Ligament of the external Ear.*
E *Part of the* Lobus *of the Ear.*

FIG. III.

Shews the fore part of the internal Ear.

A *Part of the bone of the Temples containing the rocky proces.*
B The *passage of hearing.*
C The *beginning of the passage or hive.*
D The *duglike proces.*
E The *bodkinlike proces broken off.*

FIG. IV.

The bone of the fore-going Figure is shewed, in which the passage of hearing is cut off, that so the membrane of the *Timpanum* may be seen.

AA The *beginning of the passage of hearing.*
BB The *membrane of the* Timpanum.
C The *little foot of the* Malleus *transparent by the membrane.*
D The *duglike proces.*
E The *bodkinlike appendix.*

FIG. V.

Shews the Muscles of the internal Ear.

A The *muscle moving the membrane and* Maleolus *outwards.*
B The *membrane of the* Timpanum.
CC The *muscle moving the* Malleolus *and membrane inwards.*
E The *head of the* Malleolus.

FIG. VI.

A *Part of the passage of Hearing passing to the* Timpanum.
B C The *cavity of the* Timpanum, *in which*
B The *oval hole.*
C The *round hole.*

FIG. VII

Shews the rocky proces with the smal bones of the *Timpanum* in their scituation.

A The Malleolus.
B The Anvil.
C The *superior part of the* stirrop *conspicuous.*
DD The *bowing of the* Cochlea.

FIG. 7.

Shews the three small bones out of their scituation.

A The Malleolus *with its two proceses, its short and long.*
B The Anvil *applied to the* Malleolus.
C The Stirrop.
D The *small bone joyned to the Ligament of the* stirrop.

FIG. VIII.

Shews the inferior face of the bone of the Temples.

AA The *extremity of a quil thrust through that passage of Hearing which is carried to the pallat.*
BB *Shews the same passage broke off from the next part.*

FIG. IX.

AA The *cavity of the* Cochlea, *whose broader part goes to the* Labyrinth.
BB The *cavity of the* Labyrinth, *in which the oval hole is conspicuous: also four other holes which open themselves in the circles are obumbrated by a black colour: the fist in the extremity of the circle of the* Cochlea, *is broken off. If you would see how they are in Infants, look the first Table of the eighth Chapter, the seventh figure.*

FIG. X.

AA *The beginning of the passage of the first hole of the bone of the Temples, into which the Nerve of Hearing passeth.*
BB *The rocky proces of the bone of the Temples, in which the cavities are contained.*

FIG. XI.

A B C D *The end of the passage into which the Nerve of Hearing proceeds laid open, the bone being taken away.*
B *The cavity in which the softer portion of the Nerve of Hearing lies in the Centre of the* Cochlea.
C *The proces between each portion of the Nerve standing up like a bridg.*
D *Another cavity called* Cæcum *by the Ancients,* Aquæductus *by* Fallopius, *by which the harder portion of the nerve of hearing obliquely descends.*
EE *Two footsteps of the circles in the* Labyrinth, *which you may see whol, Chap.* 8. *Table* 1. *fig.* 7,8.

FIG. XII.

Contains a portion of the bone of the Temples, in which the *Timpanum* being taken away, and the passage which contains the Nerve of Hearing there appears.

AA *The softer portion of the nerve of Hearing.*
BB *The harder portion of the nerve of Hearing, obliquely descending under the* Timpanum, *being thicker about the place it goes out.*
CC *A small Nerve from the fourth pair joyning it self to the harder nerve of Hearing.*


I
II
III
IV
V
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X
XI
XII

CHAP. 17.

Of the Bones of the Extream Parts.

FRom the Trunk of the Body of Man we come to his Limbs, from the Middle Parts to the Extream, to the contemplation of the Hands and Feet, both by the Order of Nature and of Diſſection. Theſe are the Supporters of the whol Body, the other the Stewards and Storers of it; The Limbs have ſtrong Bones, ſtout Muſcles, and very many Veſſels, for their Life, Nouriſhment, and Motion ſake.

The Bones which are commonly aſſigned to the Hand, are the Shoulders, Cubits, and ſuch as are proper to the extremity of the Hand; the Bones of the Shoulder, are, the *Claviculæ* and *Scapulæ*.

The *Claviculæ* make one Bone on each ſide, fiſtulous and thick, more bowed in Men than they are in Women: One of the Extremities of it is joyned to the *Sternum*, the other with the ſuperior Proceſs of the *Scapula*, where it produceth the *Acromium* or the top of the Shoulder: Its nexure is looſe, but with a very ſtout Ligament and ſtrengthned with Cartilages.

The Bone called *Scapula* is broad, and thin; not ſo much for the defence of the Coſtals of the Back, over which it lies like a Buckler, as for the ſafe articulation or joynting of the *Clavicula* and Shoulder: It is in form triangular, by its longeſt ſide ſtretched out in the Baſis, with which the other two being unequal in length, make two angles, the one ſuperior, the other inferior: It is hollow within, gibbous without. It ſends forth a threefold Proceſs, of which, one toucheth the top of the Shoulder, and is called the Spine of the *Scapula*, by reaſon of its figure: It is knit to the *Clavicula*: The other is lower and leſs, not much unlike a Ravens Bill, and therefore called *Coracoides*: The third is ſhorter, within whoſe Cavity the head of the Shoulder with its Cartilage is hid. To theſe come their proper additions, as ſingular Ligaments by which the *Scapula* is joyned to the head of the Shoulder, and alſo to the *Clavicula*; theſe are in number reputed to be five, the firſt of which is broader than the reſt, and ſprings from the ſhorter Proceſs encompaſſing the whol joynt, and is ſtrongly faſtened to the firſt and internal region of the head of the Shoulder: The ſecond is famous for ſtrength, produced from the external ſide of the Proceſs *Coracois*, and is inſerted inwardly into the *Acromium*. The third Ligament is round, and takes its original externally from the Proceſs *Coracois*, and ends internally in the head of the Shoulder. The fourth begins above from the Neck of the *Scapula*, and joyns it ſelf externally to the head of the Shoulder. The fifth hath

the same beginning with the former, and ends behind about the external head of the Shoulder; and these Ligaments as they regard the strength of the Shoulder, so the third, fourth, and fifth, are fitted to receive the Tendons of the Muscles.

We come now to the Bone of the Shoulder which is large and strong: It hath a great head defended with a Cartilage above: It hath a cleft before, into which the Tendinous beginning of the Muscle *Biceps* descends for its greater safeguard and strength; it is knit to the *Scapula* by *Diarthrosis*, or articulation; the Shoulder is globous before, depressed behind: the superior part of the Shoulder hath alwaies a manifest *Appendix*, so the inferior part sticks out with two Processes especially, of which the external gives beginnings to the Muscles of the *Metacarpus* and those that extend the fingers; at the other, those of the Wrest, and those that bow the Fingers have their beginning: To these comes another Prominence outwards, for the more commodious bowing of the *Radius*: Here are two Cavities, behold of which, the foremost is least, the hindmost greatest, about which the Arm is turned. The *Cubitus* is composed of a double Bone, which are joyned together at the Extremity, but separated in the middle, where notwithstanding they are joyned by a Membranous Ligament, that the motion might be the readier, and also that the Muscles might be the safer.

The first bone of the *Cubitus* is called *Ulna* because it is often used to measure things with, for of old, it was only called *Os Cubiti*, as the Bone of the Shoulder was called the Arm; this is larger than the other, and longer, and attenuated by degrees from the Back; above, it hath two Processes, one which is less and more acute, which is the foremost; the greater is more obtuse, which is the hindmost, and by the Ancients is called *Ancon* and *Olecranon*. Two Cavities are to be added to these, of which, the exterior and lesser receives the head of the *Radius*: The other is larger and semicircular, by which the *Ulna* is joyned to the Shoulder by that articulation which the Greeks call *Ginglymos*: the inferior part of the *Ulna* ends in a round knob, which is called *Styloides*, and by the intervening of Cartilages is knit by a ligament to the Bones of the Wrest.

The other Bone of the *Cubitus* is called *Radius*, and is the higher in Situation and the shorter, and having a round head, is received by the *Ulna*, although by a singular Cavity it receive the Bone of the Shoulder; at the other extremity is thicker and by a lesser Cavity receives the *Ulna*, by a greater the Bone of the Wrest.

The Hand is divided into three parts, *Carpus*, *Metacarpus*, and the Fingers: The *Carpus* or Wrest is formed of eight small Bones, something different the one from the other, both in magnitude and form; four of these are placed beneath, so many are joyned to the Bones of the *Metacarpus* by *Synarthrosis*; four are superior, of which, three are joyned to the *Cubitus* and *Radius*, they are joyned by a Cartilaginous Ligament, and by another Transverse one, which as it defends the Bones of the Wrest, so it constrains the Tendons of the Muscles to stretch out the Fingers.

The

The *Metacarpus* is compoſed of four Bones, long and ſlender, and diſjoyned in the middle, that ſo the Muſcles may lie the ſafer between the Bones, and their waight may not hinder the agility of the Hand: they have broad Apendices beneath, into the Cavities of which the Bones of the Wreſt paſs; the ſuperior are round, that they may the better receive the orders of the Fingers.

Fifteen Bones, which are diverſe in reſpect of magnitude, make up the Fingers, if you reckon the Thumb and all, for the firſt in the Fingers is larger than the ſecond, and the ſecond than the third, which is covered with the Nail; externally they are all round, internally plain, that ſo we might graſp ſollid things the eaſier: beneath they have broad Proceſſes, in the Cavity of which they receive others; above they have round Proceſſes received within the Cavities of others.

The Foot makes up the other Extream part, under which common name is comprehended the Thigh, Leg, and that which is commonly called the Foot. The Bone of each Thigh is but one, but in ſtrength and bigneſs ſecond to none, becauſe it is to ſuſtain the whol bulk of the Body; it is round before, but ſomething compreſſed behind, and hath a rough thing like a line, ſtretched obliquely towards the lower part for the more ready commiſſion of the knees: It hath famous Appendices both above and beneath, joyned to its Proceſſes; the ſuperior *Appendix* joyned to its Proceſs is large, and makes the globous head of the Thigh, having a ſtrong Neck which paſſeth into the Cavity of the *Os Iſchium*, *Ilium*, and *Pubis* (which ſome call the *Funnel*, others the *Box*:) It is kept in this Cavity with ſtout Ligaments, one is broad and Membranous, which compaſſeth about the whol joynt, the other is round which is produced from the Cavity its ſelf, and preſently received in the Head: under the neck of the Thigh are two Proceſſes beheld, and they are encreaſed by their Apendices, of which, the external is called *Trochanter* or *Rotator major*, conſpicuous with its Cavity and proper lines; the other or internal which deſigns the figure of the blunt knob, is called *Trochanter* or *Rotator minor*. Each of them hath a ſtrong and ſafe inſertion, a ſtable beginning and ſtrong Muſcles. The inferior Appendix of the Thigh waxing thick by degrees with his proceſs is placed in the Cavities of the *Tibia*, with a double Protuberance like two large Heads; the Cavity as it is light before, ſo behind it is very notable, by which large veſſels with the great Nerve of the fourth pair, is carried to the Legs: behind, Nature hath placed two Bones called *Seſamoides* to the inferior Appendices of the Thigh, which defend the beginnings of the Muſcle called *Gaſterocnemius* in its motion.

Before in the Joynt of the Thigh with the *Tibia* is the *Mola*, which alſo is called *Patella*, a ſhort round Bone, ſticking to the Tendons of the Muſcles which extend the Leg, from a Cartilaginous ſubſtance it grows to the ſollidity of a Bone by degrees: It is plain without, gibbous within and covered with a Cartilaginous cruſt; its nexure is looſe that ſo it may avoid luxation the better, and yet it is no help at all to the motion of the Muſcles.

The Leg like the Cubit is compoſed of two Bones, much differing both in thickneſs and ſtrength; they are disjoyned in the middle, and have a ſtrong Ligament between, and give ſecurity to the Muſcles that move the Feet.

The firſt and chiefeſt of theſe is called *Tibia*: It is large, ſtrong, and by reaſon of the variety of its ſides almoſt triangular, of which, the foremoſt towards the internal ſide is altogether deſtitute of fleſh, and makes an acute angle or Spine. It hath Appendices different in magnitude, of which, the ſuperior is famous in largeneſs, diducted behind into two heads, on the top with long Cavities it receives the hollow inferior Apendix of the Thigh: in the middle between the knobs ariſeth a ſtrong Ligament, which makes the articulation ſtrong, & this is helped both by that Membranous Ligament which is wrapped about the whol Joynt, and by other particular ones, both before and on the ſides. The inferior Apendix of the *Tibia* is leſs, and yet it hath a notable Proceſs ſticking out on the internal ſide of the Foot, which is called the internal Ancle: It hath alſo diverſe Cavities, one lateral, to which the *Fibula* paſſeth, and two others diſtinguiſhed by a light Protuberance which is under the Ancle: as it is above committed to the Thigh, ſo it is below committed to the Ancle by *Ginglymos*.

The other Bone of the Leg is called *Fibula*, and it is equal in length to the *Tibia*, but it is ſmaller and weaker by ods, from a thick back growing thin by degrees: It makes a light Cavity above by its round *Apendix*, to which the external bounch of the *Tibia* is joyned, and it ſends a manifeſt Proceſs to the outſide of the Foot, which is called the external Ancle-bone, and defends the *Nexus* of the *Talus* with the *Tibia*.

We come now to the Bones of the extremity of the Foot, which like thoſe of the Hands, are divided into three parts, *Tarſus*, *Metatarſus*, and the Toes: The Bones of the *Tarſus* are ſeven, which differ mightily both in bigneſs and figure.

The firſt of them is called *Talus*, or *Aſtragalus*, and conduceth more to the motion of the Foot than the reſt: It hath a large head and lightly ſinuous, that it may be the better fitted to the *Tibia*, comprehended on both ſides by the Ancles, it is joyned to the Ancles and the Bones of the *Tarſus* by various and ſtrong Ligaments before by a prominence with the Bone called *Cymbiformis*; underneath partly it ſticks out and partly hath Cavities, and is joyned to the *Calcaneus*.

The *Calcaneus*, *Calx*, or Heel-bone is the ſecond Bone of the *Tarſus*, excelling the reſt both in bigneſs and ſtrength, it is long and ſtretched out toward the hinder part, that a man might ſtand the firmer and not eaſily fall backwards, it is unequal with knobs, for the more firm nexure of the Tendons of the Muſcles extending the Feet. It hath Cavities on the ſides that it might give deſcent to the Tendons, eſpecially on the inſide by which both Tendons and Veſſels are carried to the Feet: into the *Calcaneum* are Ligaments tranſverſly inſerted from each Ancle, under which the Tendons of the Muſcles paſs ſafely to move the Toes, as it is joyned to the Bone called *Cymbiformis* before, ſo above it is joyned by ſtrong Ligaments to the *Talus*.

The

The Third Bone of the *Tarſus* is called *Cymbiformis*, or *Naviculare*, ſeeing it is carried as it were from the broader hinder part of the Hip to the Narrower fore part, by a crooked paſſage; here by a Cavity it receives the *Talus*, and is again received by the Wedg-like Bones.

Three Bones make up the reſt of the *Tarſus*, to which the Ancients gave no names. *Fallopius* calls them *Sphenoidea*, or Wedglike; of theſe, the firſt exceeds the third, and the third the ſecond in magnitude.

The ſecond part of the Foot is called *Metatarſus*, and conſiſts of five Bones, unequal both in length and thickneſs, yet are they ſtrong and disjoyned in the midſt and give ſafety to the Muſcles; they are thicker where they are joyned to the *Tarſus*, ſlenderer afterwards; at laſt being encreaſed by Proceſſes, they receive the heads of the Toes in their Cavities.

The Bones of the Toes are fourteen, of which, thoſe two of the great Toe are bigger and ſtronger than the reſt; the other Toes have three apiece, much about the bigneſs of the Bones of the Fingers.

The Bones called *Seſamoida*, remain yet to be ſpoken to, ſo called becauſe in bigneſs and compreſſed roundneſs they are like the ſeeds *Seſamus*. From their firſt original they are Cartilaginous, and grow ſollid by age: Their bigneſs is various by reaſon of the Bones they ſtick to. They uſually account twelve of them to be in the Fingers, and as many in the Toes, but uſually there is fewer. They ſtick to the Joynts under the Fingers faſtened to the Ligaments, and defend not only the Tendons, but alſo the Joynts.

But ſeeing that in the following Table you have an elegant *Sceleton*, or the joynings of the Bones of the whol Body, it were well worth the while to ſhew their nexures in a few words. The nexure of the Bones regards either Reſt or Motion; ſuch as regard Reſt, are called *Symphyſis*; and this is done either immediately, or by means of another Body.

That which is performed immediately is done three waies; of which, the firſt is *Rhaphe*, or *Sutura*, when they are ſo joyned as though they were ſewed together as the Bones of the Skull. The ſecond is *Harmonia*, or a connexure by a line as in moſt of the Bones of the upper Jaw. The third is *Gomphoſis*, and is as when a Nail is ſtuck in a board, and ſo the Teeth are faſtened in their Cavities.

Alſo the union that is made by means of another Body is done three waies. The firſt is called *Synchondroſis*, which is performed by the intervening of Cartilages; and ſuch are the Bones of the *Sternum*, *Pubis*, and many others. The ſecond is *Synneuroſis*, which is done by the intervening of Nervous parts and Ligaments, whether they be round or dilated into Membranes. The third is called *Syſſarcoſis*, which is a nexure by Fleſh, as the Muſcles about the Shoulder and Thigh, and the Gums about the Teeth.

The connexure which regards the motion of the Bones is called *Arthron*, or Articulation, and is divided into *Diarthroſis*, or Dearticulation, and *Synarthroſis*, or Coarticulation. *Diarthroſis* is a connexure of Bones, prepared for evident, ſtrong, and eaſie motion, as in the Arms, Hands, Thighs

Thighs and Feet. *Synarthrosis* is a connexure of Bones, in which motion is more obscure, weak, and difficult: both of these kinds of Articulations consists in three Manners.

The first of these is called *Enarthrosis*, namely when the Cavity receiving is deep, and the head received into it long, and this is seen in the Thigh with the *Acetabulum*, and in the *Astragalus*, with the Bone called *Cymbiforme*.

The second is called *Arthrodia* in which the Cavity is light and the head committed to it short and depressed; such is between the hinder part of the head and the first Joynt of the Neck, between the inferior Jaw and the Bone of the Temples, the Ribs with the *Vertebræ*, and the Cartilages of the Ribs with the *Sternum*, the Bones of the *Carpus* with the *Metacarpus*, and the Bones of the *Tarsus* with the *Metatarsus*.

The third is called *Gynglimus*, in which, Bones are so joyned that the head of one passeth into the Cavity of another, and in like manner his head into his Cavity, and so *Hippocrates* thought the *Vertebræ* were joyned on the hinder part, so the *Ulna* is joyned with the Shoulder, and the Thigh with the *Tibia*, the *Tibia* with the *Astragalus*, and the *Astragalus* with the *Calcaneus*.

Place here the Table of the seventeenth Chapter, which hath the Number 21. *at the corner of the brass Plate.*

CHAP. 18.

Of the Muscles of the Hands.

THE Hands, seeing they are the famous Instruments of admirable Works, cannot want both various and strong Muscles; the greatest part of which, together with those that are referred to the Feet, better deserve the names of Muscles than those which we have hitherto shewed about the Breast, Abdomen, Back, and Head; therefore

An Explanation of the Table of the seventeenth Chapter.

This Table exactly presents the Bones of Man to your view, so that the Composition of the Bones we mentioned before in the *Abdomen*, Breast, and Head are here seen, especially the Bones of the Hands and Feet are seen both before and behind; also the Ligaments of the Thigh and *Tibia*; lastly, the Bones called *Sesamoides* are curiously represented.

FIG. I.

Shews the *Skeleton* of a Body grown up.

AA The *internal side of each* Scapula.
BB *Both the* Claviculæ.
CC *The bone of the shoulder, otherwise called the bone of the arm.*
aa *The head of the shoulder produced from the appendix.*
bb *The external bunch of each shoulder.*
cc *The internal bunch of the shoulder.*
DD *The bone of the Cubit called* Radius.
EE *The bone of the Cubit called* Ulna.
FF *The eight bones of the* Carpus.
GG *The thumb composed of three bones.*
HH *The* Metacarpus *composed of four bones.*
II *The four fingers composed of three bones.*
KK *The thigh which some call* Crus.
LL *The* Mola, *or Knee-pan.*
dd *The head of the bone of the thigh, or superior appendix.*
ee *The neck of the bone of the thigh.*
ff Trochanter, *or* Rotator major.
gg Trochanter, *or* Rotator minor.
hh *The appendix, or inferior head of the thigh.*
MM *The* Tibia.
NN *The* Fibula.
ii *The internal ancle.*
kk *The external ancle.*
OO *The seven bones of the* Tarsus *conspicuous before.*
PP *The five bones of the* Metatarsus.
QQ *The bones of the toes, of which the great toe hath two, and the rest three apiece.*
** &c. *The appendices of the shoulder,* Radius, *Thigh,* Tibia, *distinguished by a small line from the rest of the bone.*

FIG. II.

Contains the *Scapula* with the *Clavicula*, to which the bones of the Shoulder, Cubit, and Hand are joyned.

A *The left* Clavicula, *in which*
a *The head which is lightly sinewous where it is committed to the* Sternum.
b *The other extremity of the* Clavicula, *whereby it is joyned to the proceß of the* Scapula.
B *The* Scapula.
c *The short proceß of the* Scapula *receiving the shoulder.*
d *The proceß of the* Scapula *called* Coracois.
e *The proceß of the* Scapula *called* Spina.
f *The superior angle.*
g *The inferior angle.*
hh *The baßs of the* Scapula.
C *The notable hinder bone of the shoulder.*
f *The greater or backward cavity of the bone of the shoulder.*
g *The crooked proceß of the bone of the* Ulna.
D *The bone* Ulna.
E *The* Radius.
F *The external face of the wrest.*
G *The* Metacarpus *consisting of four bones.*
H *The Thumb consisting of three bones.*
II *The orders of the fingers.*

FIG. III.

Contains the eight bones of the Wrest expressed largely, that so they might be the better distinguished.

FIG. IV.

Shews the *Os Ischium, Ilium,* and *Pubis*, and under them, the thigh leg, and Foot.

A *The external face of the* Os Ilium
B *The* Acetabulum *which receives the head of the thigh.*
C *The thigh conspicuius behind, in which*
a *The superior appendix.*
b Trochanter major.
Δ *The rough line of the thigh.*
c Trochanter minor.
d *The posterior cavity of the inferior appendix.*
ee *The heads of the inferior appendix.*
f *The protuberances distinguishing the cavities of the* Tibia.
D *The* Tibia *conspicuous behind.*
g *The internal ancle.*
E *The* Fibula.
h *The external ancle.*
** *The appendices of the* Tibia.
F *The* Tarsus.
G *The* Metatarsus.
H *The great toe consisting of two bones.*

FIG. V.

Propounds the bones of the *Tarsus* distinctly, in which

A Os Astragali.
B Os Calcanei.
C Os Cymbiforme.
D Os Cubiforme.
EEE *The three other Wedlike bones.*

FIG. VI.

Shew the four greater and four lesser bones called *Sesamoides.*

FIG. VII.

Shews the superior part of the thigh with the *Acetabulum.*

aa *A broad Ligament compassing the joynt of the thigh dissected.*
b *A round Ligament arising out of the* Acetabulum.

FIG. VIII.

The inferior part of the Thigh and superior part of the Leg is shewed.

a *A broad Ligament compassing the Joynt.*
b *A Ligament produced out of the Sepiment.*
cc *The cavities of the* Tibia *receiving the thigh.*
d *The knee-pan with a portion of the tendon joyned to it.*

therefore that they may not want their vulgar distinction wherein they are distinguished into Head, Belly and Tail, being something like *Mice* or *Lizards* if you take away their Feet: we must take the beginning of the Muscle for the head, that part to wch the contraction is made; for the tail, the end of the Muscle, or that thin and Nervous part by which it moves; for the belly, the middle part of the Muscle, which is more swelled by reason of Flesh.

The Tendines of these move admiration almost, being famous in strength, and cleer in colour; and although we call it the tail of the Muscle, yet is it properly a Spermatical part stretched along the length of the Muscle, which being before scattered in *Fibræ*, is now gathered together, and being endewed with Spirit by the Nerves, moves the part it is inserted into by contracting it.

The Muscles of the Hand, pertain, some to the Shoulder, some to the Cubit, and some to the Hand it self. The Muscles called *Deltoides*, lift up the Shoulder, called so from its form, being large and fleshy; it ariseth from a broad beginning from the middle *Clavicula*, the top of the Shoulder or *Acromium*, and it is fastened into the midst of the Shoulder with a strong Tendon: Also the Muscle which proceeds from the Process of the *Scapula* called *Coracois*, helps to perform this office. It hath a long fleshy body, and is inserted about the middle of the inner part of the Shoulder. The Pectoral Muscle which we spake of in his proper place, draws the Shoulder to the Breast, and the broadest of the Back draws it back again, of both which we spake in the twelfth Chapter.

The Muscle called *Rotundus major* depresseth the Shoulder; it is of a fleshy thick body: It ariseth from the inferior angle of the *Scapula*, and is inserted into the Shoulder neer the Tendon of the Pectoral Muscle. Also the Muscle called *Rotundus minor* depresseth the Shoulder, and if you heed their nexure, it is but a certain portion of the former: it ariseth from the inferior angle of the *Scapula*, and from a round belly becomes slenderer, and ends in the Neck of the Shoulder.

Three Muscles seem to compass the Shoulder about; of which, two are placed above the *Scapula*, three beneath it: the first of the Suprascapulars, arising from the Basis of the *Scapula*, above the Process called *Spiniformis*, is carried foreward with a strong Tendon and knit to the fift Ligament of the Shoulder. The second arising from the Basis of the *Scapula* under the *Spina*, being fleshy and thick ends with a short and broad Tendon in that Ligament of the Shoulder which is called the fourth. The *Infrascapularis* is carried from the inferior side of the Basis of the *Scapulæ*, being fleshy and broad and ends in the third Ligament of the Shoulder,

The Cubit is bowed by two Muscles placed before; of which, the first is called *Biceps* from his double beginning; from its figure it is called, a Fish: it ariseth partly from the Funnel of the *Scapula*, partly from the Process *Coracois*, and descends into the superior head of the *Radius*, with a round but strong Tendon. The other of the bowing Muscles is called *Brachiæus*; this lies under the former: it takes its beginning about the middle of the Shoulder, and being dilated downwards with a

fleshy end, it concludes as well in the Ligament of the Joynt, as in the Appendix of the *Ulna* and *Radius*.

The Cubit is extended by two other Muscles called *Postici*, of which, the first and longer is composed of a double beginning; one high about the Neck of the *Scapula*, the other low under the head of the Shoulder; under the Tendon of the broadest Muscle of the Back; it is broad within, and ends outwardly in the top of the Cubit: The second extender is shorter and ariseth about the middle of the Shoulder, and being joyned to the former it ends outwardly on the top of the Cubit. To these Extenders the Muscle called *Anconeus* is joyned, being of a very smal body, arising behind from the inferior part of the Shoulder, and descends a little obliquely into the side of the *Ulna* between the two Bones of the Cubit.

To move the *Radius* are four Muscles produced, of which, two which are commonly called *Pronatores*, turn the *Radius* inwards; the other two are called *Supinatores*, and move it outwards. The first of the *Pronati* is square in form, rising transversly from the internal side of the *Ulna*, and is committed to the internal part of the *Radius*. The second is called *Teres* from its round body produced from the internal bunch of the Shoulder, and passeth obliquely almost to the middle of the *Radius*.

The first of the *Supinati* which is the longer, takes its beginning higher above the external bunch of the Shoulder, and sending down a Membranous Tendon passeth to the inferior Appendix of the *Radius*: the other is shorter and thin, arising below about the Ligament of the Shoulder, and ends neer the middle of the *Radius*.

Four Muscles are assigned to the Wrest, although three of them come even to the *Metacarpus*: two of these are bowers and as many extenders of the bowers of the Wrest by reason of their difference of Scituation: the one is called internal, the other external; both of them arise from the internal knob of the Shoulder: The internal passeth to the fourth Bone of the Wrest, the external to the Bone of the *Metacarpus* that passeth to the fore-finger.

The internal of the extending Muscles, descending from the external knob of the Shoulder, is carried to the bone of the *Metacarpus* which is subject to the little finger. The external Extending Muscle, arising above the external bunch of the Shoulder, is fastned often times with a double Tendon, into the first and second Bone of the *Metacarpus*.

To the palm of the Hand is referred the Muscle called *Palmarius*, by means of which the wrinkling of the skin is the better performed. It takes its beginnig from the internal bunch of the Shoulder, and stretcheth out a Membranous Tendon by the Palm of the Hand, even to the confines of the Fingers, the fleshy Membrane again unfolds the skin being wrinkled by this Muscle.

The Fingers of the Hand requires various motion and strength, and therefore various Muscles with strong Tendons, bow them, extend them, and turn them to the sides. Of the bowing Muscles, some are subservient to more Fingers than one, some only to the Thumb: Those that

that are ſubſervient to more, are thoſe that are dedicated to the motion of the firſt, ſecond, and third *Internodii*, of the four Fingers; (I do not know what Engliſh word to give *Internodium*, it ſignifies the ſpace between one Joynt and another) that which bows the ſecond *Internodium* takes its beginning from the internal knob of the Shoulder, and toward the end is divided into four Tendons, which paſs into the ſecond Bones of the Fingers: The Muſcle bowing the third *Internodium*, takes its beginning from the internal bunch of the Shoulder, and the foremoſt Proceſs of the *Ulna*, and with four ſtrong Tendons proceeds to the third Bones of the Fingers. The bowers of the firſt *Internodium* of the Fingers, by reaſon of its thin and round Body is called *Lumbricalis*, and ariſeth from the Membranes of the Tendons of the foregoing Muſcle, and is externally inſerted in the firſt bone of the Fingers.

The Thumb becauſe it hath a ſingular ſtrength above the reſt of the Fingers, hath diverſe bowers: Two Muſcles bow its firſt *Internodium*, which take their beginning from the annular Ligament of the Wreſt and the Bone ſubject to the Thumb, and end in the firſt Bone of the Thumb: Three or four bowers move the ſecond *Internodium* which are but ſhort, yet fleſhy; they ariſe from the bones of the *Metacarpus* which ſuſtain the fore, middle, and Ring-finger, and end in the ſecond Bone of the Thumb: The bower of the third bone is but one, but that one is very ſtrong; this takes its beginning from the *Ulna*, where it receives the head of the *Radius*, paſſeth to the third *Internodium* of the Thumb with a ſtrong Tendon; and theſe are the Muſcles which bow the Hands.

The ſtretchers out of the ſecond and third *Internodii* of the Fingers, are held to be two, though indeed they ſeem to be but one Muſcle, for both of them riſe from the external bunch of the Shoulder, and are exquiſitly joyned in their progreſs, their tendons being united, and knit to the ſecond and third Bones of the Fingers, having neither difference in body nor office. The interoſſeal Muſcles extend the firſt *Internodium* of the Fingers, of which more by and by.

The Thumb as it hath two bowers, ſo hath it two ſingular extenders, one of which riſing from the exterior ſide of the *Cubitus*, aſcends even to the third *Internodium* of the Thumb; the other coming from the like beginning, paſſeth by a ſuperior portion to a bone of the Wreſt under the Thumb, by an inferior portion to the firſt and ſecond *Internodium* of the Thumb, and alſo further.

Beſides theſe motions the Fingers are disjoyned, and then again joyned, ſix Muſcles perform this office, of which, Authors call the three external Interoſſeal, being placed between the Bones of the *Metacarpus*; theſe riſing up between the ſides of the Fingers internally and externally, ſtretch their Tendons even to the firſt, ſecond, and third *internodium*, to which two Muſcles of a like office come, and are as auxiliaries to them, from the firſt and laſt bone of the *Metacarpus*.

The fore Finger hath ſingular *Abductors*, and ſo hath the little Finger. The *Abductor* of the fore Finger is more rightly called *Indicator*: It proceeds from the middle of the Cubit, and paſſeth frequently with a dou-

ble body and Tendon, to the first *Internodium* both of the fore and middle Finger, and yet sometimes it terminates in the bone of the *Metacarpus*, which regards the fore Finger. The *Abductor* of the little Finger proceeding from the fourth bone of the Wrest passing by the Palm of the Hand, is externally inserted into the first *Internodium*. The Thumb hath its proper *Adductor* and *Abductor*, received in its first *Internodium*: the *Abductor* takes its original from the little bone of the Wrest joyned to the Thumb; the other from the bone of the *Metacarpus*, which sustains the fore Finger; yet here by reason of its firm nexure by its Tendinous Body, to the first bone of the fore Finger it seems to draw the fore Finger to the Thumb.

Place here the Table of the eighteenth Chapter, which hath the Number 22. *at the corner of the brass Plate.*

CHAP. 19.

Of the Muscles of the Foot.

FOR the readiness of going, the Foot is aided with various Muscles; part of which, fit the Thigh and Leg, and part, the Foot it self with various motions. The Muscles which bow the Thigh are called *Psoas*, *Iliacus internus*, also the *Triceps* and *Lividus*.

The *Psoas* takes its beginning about the two inferior *Vertebræ* of the Breast, and the three superior of the Loyns, and descends obliquely to the lesser rotation of the Thigh, The internal Iliack ariseth from the internal face of the *Os Ilium*, and its Tendon being joyned with the former, it terminates with it. The Muscle called *Triceps* is famous amongst the rest for its bigness, it ariseth from the *Coxendix* and *Os Pubis*, with a three-fold beginning, and is inserted below into the rough line of the Thigh. The *Lividus* is produced from the commissure of the Bones of the *Pubis*, and inserted into the internal side of the Thigh by a short Tendon.

Three

AN EXPLANATION OF THE TABLE OF THE EIGHTEENTH CHAPTER.

This Table comprehends the Muſcles which move the Shoulder, Cubit, and Hand: of which the greater part ſtick to their beginnings and ends.

FIG. I.

A Muſculus Deltoides *ſeparated from the beginning*
B Infraſcapularis *ſeparated.*
C Rotundus minor.
D Rotundus major.
E *The pectoral muſcle ſeparated from the breaſt,* vide *Chap.* IX.
F *The fleſhy portion of the broadeſt muſcle of the back,* vide *Chap.* XII.
G Muſculus Biceps.
H *The leſſer muſcle lifting up the ſhoulder in his Scituation.*
II *The* Brachiæus *under the* Biceps.
K *The muſcle* Palmaris *hanging from its original.*
L *A portion of the* Supinator.
M *The external bower of the Wreſt.*
N *The internal bower of the Wreſt.*
O *The bower of the ſecond* Internodium *of the fingers.*
P *The bower of the third* Internodium *of the fingers.*
Q *The bowers of the firſt* Internodium *of the thumb in their firſt ſcituation.*
R *The bowers of the ſecond* Internodium *of the thumb in their ſcituation.*
S *The* Abductor *of the little finger.*
aa *The internal face of the* Scapula.
b *The tendon of the muſcle* Palmaris.
c *A portion of the tendon which bows the third* Internodium *of the thumb.*
d *The Ligament of the Wreſt in its ſcituation.*

FIG. II.

A *The leſſer muſcle lifting up the ſhoulder.*
B *The muſcle* Brachiæus *whol.*
C *The round* Pronator *of the* Radius.
D *The bower of the third* Internodium *of the thumb out of his ſcituation.*
E *The ſquare* Pronator *of the* Radius.
F *The bowers of the firſt* Internodium *of the thumb out of their ſcituation.*
G *The bowers of the ſecond* Internodium *of the thumb out of their ſcituation.*
aa *The internal ſide of the* Scapula.
b Os Humeri.
c Os Radii.
d Os Ulnæ.
ee *The membranous Ligament of the* Ulna *and* Radius.
ffff *The muſcles commonly called* Adductors.
h *The* Abductor *of the little finger.*

FIG. III.

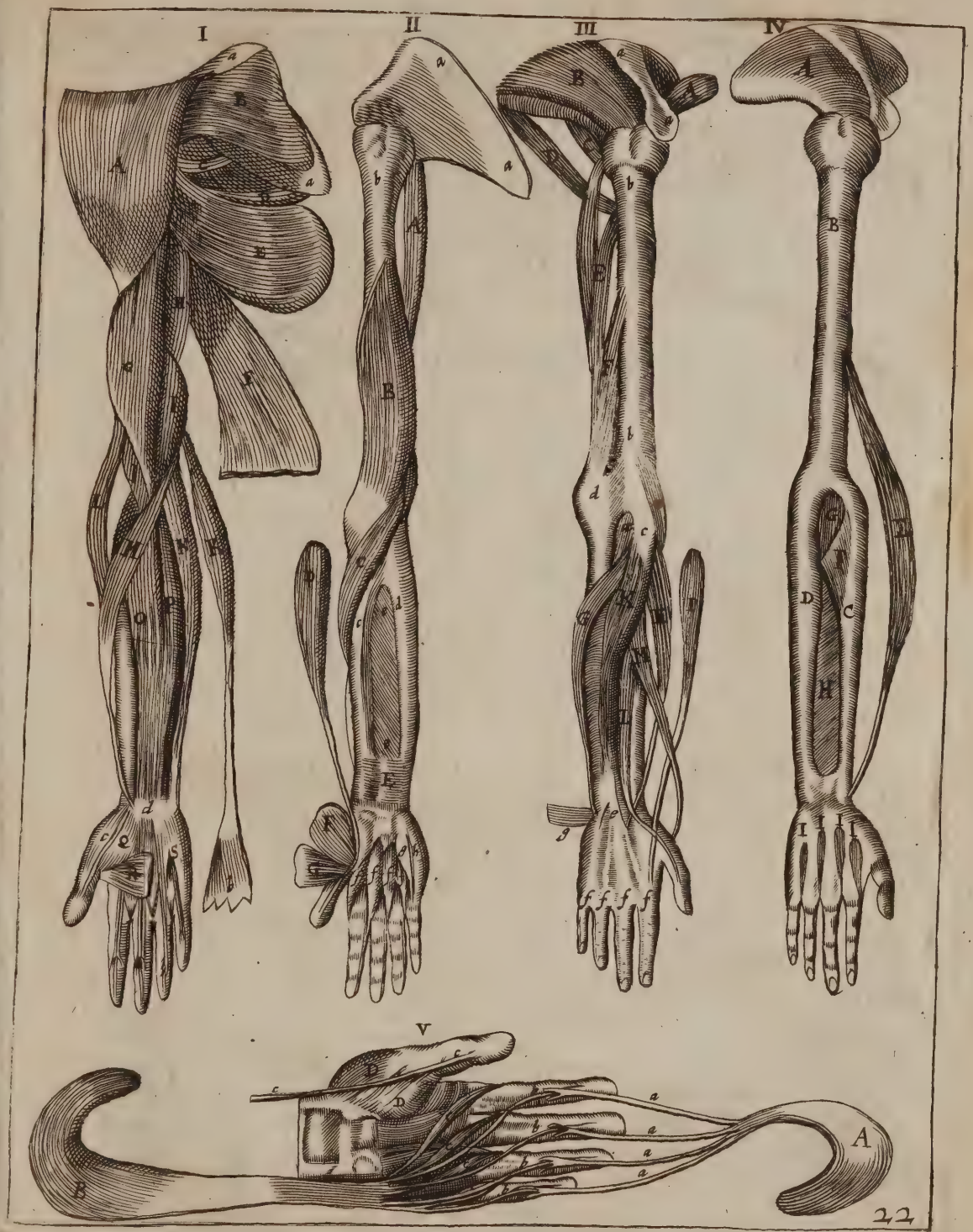
A *The firſt* Supraſcapularis *removed out of his place.*
B *The ſecond* Supraſcapularis.
C Rotundus minor.
D Rotundus major.
E *The long muſcle extending the Cubit.*
F *The ſhort extender of the Cubit.*
G *The internal extender of the wreſt.*
H *The external extender of the wreſt, having here but one tendon.*
I *The ſpecial* Abductor *of the fore finger with but one tendon.*
K *The extendors of the ſecond and third* Internodij *of the fingers united.*
L *The extendor of the third* Internodium *of the thumb.*
M *The extendor of the firſt* Internodium *of the thumb, having here but one ſingle body and tendon.*
aa *The proceſs of the* Scapula *called* Spiniformis.
æ *The muſcle* Anconeus.
bb *The bone of the ſhoulder.*
c *The external knob of the ſhoulder.*
d *The internal knob of the ſhoulder.*
e *The tendines which extend the ſecond and third* Internodium *gathered together.*
ff &c. *The tendons of the ſame muſcles applying to the* Internodij.
g *The annular Ligament of the wreſt looſed.*

FIG. IV.

A *The external face of the* Scapula.
B *The bone of the ſhoulder covered with the* Perioſtinum.
C Os Radij.
D Os Ulnæ.
E *The muſcle of the* Radius *called* Supinator longus.
F *The muſcle of the* Radius *called* Supinator brevis.
G *The muſcle* Anconeus.
H *The membranous Ligament of the* Radius *and* Ulna.
IIII *The three* interoſſeal *muſcles with their* Auxiliary.
K *The* Abductor *of the thumb.*

FIG. V.

A *The muſcle bowing the ſecond* Internodium *of the fingers called* Perforatus.
aa &c. *Their tendons.*
B *The muſcle bowing the third* internodium *of the fingers called* Perforans.
bb *Its tendines paſſing through the clefts of the tendines of the former.*
CCCC *The muſcles bowing the firſt* Internodium, *or* Lumbricals.
DD *The bowers of the thumb in their ſcituation.*
cc *A portion of the tendon bowing the third* internodium *of the thumb.*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Three Muſcles extend the Thigh which are called *Glutæi*, and alſo prepared by the providence of the Almighty for the better accommodation of the ſitting, and the ſafeguard of the Joynt *Iſchium*: of theſe, that which is called *Glutæus major*, being ſtretched from the brim of the *Ilium*, *Os Sacrum*, and *Coccix*, it ends under the great *Rotator* of the Thigh. *Glutæus medius* ariſeth from the *Os Ilium* under the former, and is faſtened with a ſtrong Tendon into the ſame *Rotator*: the leſſer *Glutæus* ariſeth below from the *Os Ilium*, and deſcends to the ſuperior part of the greater *Rotator*. Theſe three, though ſhort, yet fleſhy and ſtrong Muſcles, as they extend the Thigh, ſo the Muſcle *Triceps* before mentioned, moves the Thigh inwards, whereby we climb the Maſts of Ships and Trees, and ſit firmly on a Horſe.

There move the Thigh about the Muſcle called *Pyriformis*, otherwiſe called the external Iliack, the external and internal *Obturator*, to which a fourth is added. The *Pyriformis* riſing below from the *Os Sacrum*, is tranſverſly inſerted behind with a round Tendon into the greater *Rotator*. The external *Obturator* ariſeth from the external compaſs of the hole, which is commonly accounted the original of the Bones of the *Pubis*, and paſſing tranſverſly is received in the Cavity of the great *Rotator*. The internal *Obturator*, ariſeth from the internal Circumference of the aforeſaid hole, and with a four-fold collection of Tendons, though with a ſingle fleſhy habit, it paſſeth to the place the former did; for its ſafeguard ſake it is ſent through a fleſhy ſubſtance like a purſe. A fourth is added to theſe, which ariſing from the external knob of the *Os Ilium*, and the Appendix of the *Iſchium* proceedsto the hinder part of the great *Rotator*.

The *Tibia* is extended by four Muſcles, *Membranoſus*, *Rectus*, *Vaſtus externus*, and *internus*. The Membranous muſcle ariſing before from the brim of the *Os ilium*, with a ſmal and fleſhy body, afterwards compaſſing the Thigh about on every ſide with a broad and membranous Tendon. It is inſerted into the *Tibia* and *Fibula* under the Knee. The right muſcle deſcending from the internal knob of the *Os ilium*, includes the Knee with a broad and ſtrong Tendon, and terminates in the *Tibia*. *Vaſtus externus* is ſo called from its bulk, it deſcends from the great *Rotator* of the Thigh outwardly, and mixing its large Tendon with the former, it ends in the ſame place with it. *Vaſtus internus* takes its beginning from the neck and leſſer *Rotator* of the Thigh, and is united to the two former by a membranous Tendon, and is knit internally under the Knee-pan. To theſe extenders of the *Tibia* they ad the muſcle called *Crureus*, which ſticks to the Thigh as the *Brachiæus* doth to the Arm; its original is taken between the two *Rotators* of the Thigh, and it unites its Tendons with the Muſcles called *Vaſti*.

The *Muſculus Subpoplitius* moves the *Tibia* obliquely, which being produced from the Ligament of the Knee before, ends obliquely in the ſuperior Appendix of the *Tibia*.

There bow the *Tibia* the muſcles called *Faſcialis*, or *Sartorius*, *Gracilis*, *Seminervoſus*, *Semimembranus* and *Biceps*. The *Faſcialis* deſcends from the foremoſt Appendix of the *Os ilium*, with a long and oblique decurſion to

the internal part of the Leg under the Knee. *Gracilis* arising neer the commissure of the Bones of the *Pubis*, ends under the former with a round Tendon. *Seminervosus* descending from the *Coxendix* beneath, and passing obliquely forwards by the posterior part of the Thigh is inserted into the internal part of the *Tibia*. *Semimembranosus* ariseth from the same beginning, and fastens his Tendon in the internal part of the *Tibia* behind. *Biceps* ariseth with a longer portion where the two former do, but is much increased with a fleshy portion in the midst of the Thigh, and ends with a strong Tendon in the top of the *Fibula*.

The Muscles which particularly move the Feet are to be referred to the *Tarsus*, or Toes, or great Toe: The *Tibialis anticus* and *Peroneus secundus* bow the *Tarsus*. The *Tibialis anticus* arising from the superior Appendix of the *Tibia* and *Fibula*, runs transversly under the Ligament of the Foot, and ends in the bone of the *Tarsus* subject to the great Toe. *Peroneus secundus*, is produced from the fleshy rise of the *Fibula*, and is inserted externally, usually with a double Tendon into the bone of the *Tarsus*, subservient to the little Toe.

The Muscle called *Tibialis posticus* moves it obliquely downwards and inwards, and the *Peroneus primus* outwards. *Tibialis posticus* arising between the *Tibia* and *Fibula*, is inserted into the bone of the *Tarsus* which is committed to the *Cubiforme*, neer the internal Ancle. *Peroneus primus* is deduced from the Appendix of the *Fibula* about the external Ancle, and is turned back under the Ligament of the Foot, and fastened in the bone of the *Tarsus*, which is joyned to the great Toe.

Gasterocnemius and *Musculus soleus* extend the *Tarsus*: both of them famous Muscles, not only by reason of the bulk of their bodies, but also by reason of the strength of their actions, and they seem to make up that bulk which is called the Calf of the Leg. The *Gasterocnemius* is accounted double, because it ariseth from a double beginning, from the internal and external inferior head of the Thigh, it is inserted into the Heel with a strong Tendon, although it seem to be stretched out under the soal of the Foot even to the confines of the Toes. *Soleus* takes his denomination from the figure of a Fish so called; it ariseth behind from the *Fibula*, and its Tendon is inserted with the former; here by reason of its thickness and strength, this Tendon above all the rest in the body is called the *Great Chord*: before, it is inserted into the Heel, it is severed a little from the *Tibia*, and being grievously either wounded or bruised, it brings pernicious Symptoms. Between these extenders is the Muscle called *Plantaris*, which arising with a small body from the inferior external head of the Thigh, sends a long and slender Tendon to the Heel.

The Muscles which move the Toes, extend, bend, and oblique their Bones; the extender of the third *internodium* is dilated from the superior Appendix of the *Tibia*, under the transverse Ligament of the Foot, and admitted with four Tendons into the top bone of each Toe. The extendor of the second *internodium* comes from the Ligament on the back of the foot, and passeth with four Tendons to the four second bones. The Interosseal Muscles extend the first *internodium*, of which by and by.

That

AN EXPLANATION OF THE ABLE of the ninteenth Chapter.

This Table shews the Muscles produced by Nature for the various motions of the Thighs, Legs, and Feet.

FIG. I.

A *The greater part of the muscle called* Psoas, *which you may see in the* 1. *figure of Chap.* x1. *in its Natural scituation, here it is separated from its beginning, and joyned to the internal Iliack muscle, and descends to the thigh.*

B *The internal Iliack muscle.*

CC *The muscle* Triceps *something uncovered: you may see it whol in the next Figure.*

D Musculus Lividus.

E *The membranous muscle conspicuous with a fleshy body about his beginning, whose broad tendon is separated from the parts under it.*

FF *The right muscle.*

GG Musculus vastus externus.

HH Musculus vastus internus.

II Musculus facialis.

K Musculus Tibialis anticus.

LL Musculus Peroneus secundus.

MM *The Extendor of the third* internodium *of the toes.*

N *The extender of the third* internodium *of the great toe.*

aa *The appendix of the* Os Ilium *laid open before.*

b *The extremity of the* Os Pubis.

cccc *The tendon of the membranous Muscle.*

dd *A portion of the muscle* Gasterocnemius *hanging out, the leg being depressed: the third Figure shews it hanging out of its scituation under the character KK.*

e *The membranous Ligament of the* Tibia *and* Fibula.

ffff *The tendines of the muscles extending the third* Internodium.

g *The transverse Ligament of the foot separated.*

FIG. II.

A *The internal face of the* Os Ilium.

B A *portion of the great muscle* Glutæus, *which the following figure represents separated from the middle* Glutæus.

CCC Musculus Triceps.

DD A *portion of the* Gasterocnemius *and* Soleus *as yet joyned.*

EE Tibialis posticus.

FF Peroneus primus.

G *The extender of the second* internodium *of the toes in its scituation.*

aaaa *The interosseal muscles.*

FIG. III.

A Glutæus major *separated and depressed to the side.*

B Glutæus medius *in his scituation.*

C Musculus Pyriformis.

D *The fourth muscle moving the thigh about.*

E Obturator internus *entring the fleshy purse.*

FF Musculus gracilis.

GG Musculus Seminervosus.

HH Musculus Semimembranosus *elegantly expressed.*

III Musculus Biceps.

KK *The* Gasterocnemius *turned backwards, to whose beginnings two small bones called* Sasamoides *stick.*

LL Musculus soleus *in his scituation.*

M *The little muscle called* Plantaris.

N *The tendon spread abroad from the heel under the soal of the foot.*

O *The* Abductor *of the great toe.*

P *The* Abductor *of the little toe.*

Q *The interosseal muscle pertaining to the little toe.*

aa *The brim of the* Os Ilium.

b *The fleshy purse.*

FIG. IV.

A *The internal face of the* Os Ilium.

B Musculus Glutæus minor *in his scituation.*

C Musculus Glutæus medius *out of his scituation.*

D Musculus Pyriformis.

E *The fourth muscle moving the thigh about.*

E *The external* Obturator.

F *The internal* Obturator.

G *The fleshy purse.*

H Musculus Popliteus.

II Musculus perforans.

K *The muscle bowing the third* internodium *of the great toe.*

L Musculus perforatus *in his scituation.*

M The Abductor *of the little toe.*

N The Abductor *of the great toe in his scituation.*

FIG. V.

a The *greater* Adductor *of the great toe.*

bb The Abductor *of the great toe.*

c The Abductor *of the little toe.*

dddd The *internal interosseal Muscles.*

e The *lesser* Adductor *of the great toe.*

FIG. VI.

A The *muscle* Perforatus *which bows the second internodium.*

B The *bower of the third* internodium *of the great toe.*

C Musculus perforans, *or the bower of the third* internodium.

DD A *portion of the musculous flesh joyned to the beginnings of the lumbrical muscles.*

eeee The *lumbrical muscles.*

ffff The *interosseal muscles with the* Abductors *of the great and little toe.*


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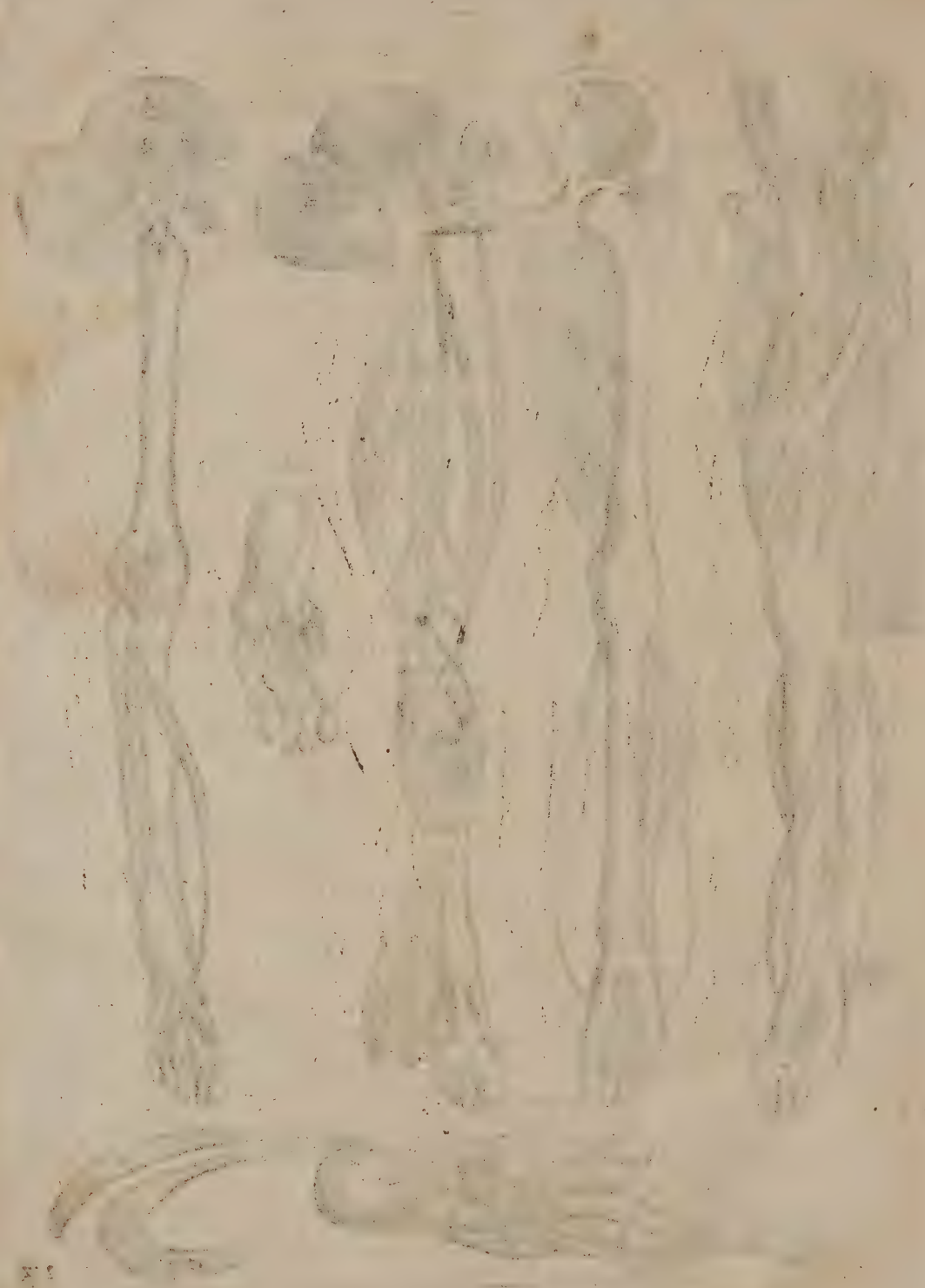


that which particularly extends the great Toe, takes its beginning about the middle of the *Fibula*, under the transverse Ligament of the Foot and so passeth to the three bones of the great Toe; sometimes the Tendon is doubled, and passeth partly to the first *Internodium*, and partly to the bone subject to it.

The Muscles called *Perforans*, *Perforatus*, and *Lumbricales*, bow the Toes. *Perforans* which they also call *Sublimis*, takes its beginning behind from the *Tibia*, about the internal Ancle, passing under the Ligament of the *Tibia* and Heel; in the soal of the Foot being divided into a four-fold Tendon, it passeth into the extream *internodium* of the Toes. *Perforatus* is by some called *Profundus*, it proceeds beneath from the Heel, and sending out four Tendons, which are divided toward the end for the passage of the Tendons of the foregoing muscle, they pass to the second *internodium* of the Toes. Nature frames the *Lumbricals* of the Tendons, of the two former Muscles, as in the Hands, and in four Tendons they are fastned to the first *internodium* of the Toes; a portion of musculous flesh moves forward the bowing of these, which being stretched from the Heel, mixeth it self with the beginnings of the Lumbrical muscles. The proper bower of the great Toe proceeds behind from the *Fibula*, and follows the way of the Muscle *Perforans*, and is inserted by a strong Tendon into the third bone of the great Toe.

The Interosseal muscles moves the Toes obliquely, placed between the bones of the *Metatarsus*, of which, such as are external pass to the first *internodium* of the Toes; the internal pass even to the second Joynt: these muscles also extend the first and second bone of the Toes; the Toes are drawn together by the internal, drawn asunder by the external.

The great and little Toe have singular muscles, the one hath one Abductor, and two Adductors; the other one Abductor. The *Abductor* of the great Toe takes his rise from the Ligament of the Heel, and passeth to its first *internodium*. The greater *Adductor* ariseth from the Ligament of the bone of the *Metatarsus*, which is next to the little Toe, and by an oblique process passeth to the first Joynt of the great Toe: The lesser *Adductor* is transverse in Scituation, and ariseth from the Ligament of the little Toe, which binds the first *internodium*, and passeth with a short and broad Tendon to the first bone of the great Toe. The *Abductor* of the little Toe is produced outwards from the Heel, and ends in the external side of the first *internodium*.

Place here the Table of the nineteenth Chapter, which hath the Number 23. at the corner of the brass Plate.

CHAP.

CHAP. 20.

Of the Veins, Arteries, and Nerves of the Extream Parts.

LEst the Extream parts should be wearied with continual labor, they have nourishment and vital vigor administred to them by the Veins and Arteries, and Spirit which is the Author of voluntary motion by the Nerves.

The Veins which are distributed to the Hand take their original from the common Branch, for the subclavian Vein passing out of the Cavity of the Breast, changeth its name into *Axillaris*, and having first sent out the external and internal Scapular Vein, it is divided into two famous Branches, the one external, the other internal, of which, the one makes the Cephalick or Humeral Vein, the other the Basilick or Liver Vein.

The Cephalick Vein descending from the upper part of the axillar by the Shoulder, neer the external side of the Muscle that bows the Cubit, gives certain small Branches to the skin and muscles, and being dilated to the external knob of the Cubit, it is commonly distributed into three Branches; of which, the first which is the smallest is sent to the Muscles which bow the Fingers, and the long *Supinator*, and therefore is called the deep Branch of the *Cephallica*. The second branch which is internal and larger, is obliquely carried under the Joynt of the Cubit, and being united to the internal Branch of the *Basilica*, makes that Vein which is usually called the median or common Vein; this also descending, after it hath distributed certain branches to the *Radius*, is divided into two small Branches, of which, that which goes to the Thumb, is called the Cephallical Vein of the Hand, the other hath no name and passeth to the fore and middle Fingers: The third Cephalical Branch and the external, passeth obliquely by the *Radius* to the external or hinder part of the Cubit, where being joyned to a smal Branch of the *Basilica*, it gives branches to the annular and little Finger, of which, that which passeth to the little Finger is called the *Salvatella* of the Hand.

The Basilical branch of the axillar Vein, after it hath brought forth the superior and inferior Breast-vein, it enters the Arm, and brings forth the Liver-vein in the right Arm, and the Spleen-vein in the left Arm, or if you will the left *Basilica*, this giving Branches to the axillar *Glandulæ*, it is divided into two Branches, of which, the deepest associating it self with the Artery and the Nerve of the third and fourth pair passing the Joynt of the Cubit, it is again distributed into two branches, one external

ternal, from which the Thumb, fore, and middle Finger, the other internal from which the Ring and little Finger have Veins. The other Branch of the *Basilica* is called *Subcutaneus*, descending to the Cubit produceth its double Vein, the one internal which in the bowing of the Elbow sending out a Vein which joyns it self to the next descending ones, is afterwards joyned to the Cephalical Branch and makes the *Median*, the other external, which divides its self, and by its greater branch passeth to the Wrest and little Finger, and by its lesser to the internal part of the Hand.

All the Arteries of the Hands proceed from the Axillar branch of the subclavian Artery which is joyned to the internal side of the Shoulder, to the internal branch of the *Basilica* after it hath sent out the scapular and Breast Arteries, and to the Muscles which occupy the internal side of the Shoulder, and two branches to the Joynt, under the bowing of the Elbow it is divided into two large Arteries, of which, the external is carried to the Wrest neer the *Radius*, where its motion is felt by Physitians, and having distributed a small branch to the hinder part of the Hand, being carried under the annular Ligament it is distributed to the Thumb, Fore and middle Finger; the internal branch descending neer the Cubit is deeper and sends branches to the middle, ring, and little Finger.

The Nerves of the Hands take their beginnings from the fift, sixt, and seventh pairs of the Neck, also from the first and second of the Breast; they are first joyned by a various nexure, before they pass to the extream parts: they are vulgarly accounted six pair.

The first pair is carried to the Muscle *Deltois*, and the skin of the Arm.

The second pair is thicker and being carried by the midst of the Arm before, is inserted into the muscle *Biceps* with two branches, and afterwards in its progress gives a branch to the external *Supinator* of the Wrest: the rest being produced by the bowing of the Elbow, is divided into two Branches, the external of which joyns its self a companion to the Cephalick Vein, and passeth to the second *internodium* of the Thumb, and the internal which is thicker and divided under the Median Vein, and extends its external branch to the Wrest, and its internal being dilated neer the *Basilica*, sends out small Nerves on both sides to the Palm of the Hand.

The third pair being joyned neer the second, having first sent a final branch under the skin, after it toucheth the Arm, sends out branches to the second bower of the Cubit, to the Muscles bowing the third *internodium* of the Fingers, and branches to the Thumb, fore, and middle Finger.

The fourth pair is larger and thicker than the rest, and at its rise is neer the *Basilica* Vein, the Artery and the third pair of Nerves, and first bestows a double Branch upon the Muscles that extend the Arm, and the skin; about the joynt of the Elbow it sends two Branches to the Wrest, also Branches to the external and internal side of the Thumb, fore, and middle Finger, three Branches to the muscles, extending the Wrest and

Fingers, the remainder is distributed to the Wrest.

The fift pair of Nerves is neer the former, and sends Branches to the Muscles arising from the internal knob of the Shoulder; it produceth two Branches, of which, one passing to the Palm of the Hand, is subservient to the little, ring, and middle Finger: the other runs to the extremities of those Fingers.

The sixt pair, which is the last of the Nerves of the Neck, is almost altogether subcutaneous; it hath diverse branches, most of which, some pass under, some above the *Basilica*, which being pricked in letting blood, cause acute pain, and convulsions; the remainder of it ends in the Wrest. Note this, That neither the Veins, Arteries, nor Nerves, have the same bigness in all Bodies, nor yet the same number nor passage: observe the like in the Foot.

We come now to the Veins of the Foot, which take their original from the the Iliack Branch of the *Vena Cava*.

The first is the *Saphena*, produced by a long product, by the internal side of the Thigh and Leg, sending branches from the beginning and about the middle to the Thigh and Knee; it is at last divided into many Branches about the Thigh and Ancle, to the Toes, especially the great Toe.

The second crural Vein is called *Ischias*, proceeding externally from the same Root; this is shorter and runs transversly to the skin before, and the muscles of the *Coxendix*, which are next to it.

The third is called *Muscula*, produced from the crural Branch descending to the Muscles, to which it gives a double branch, internally and externally, nay, sometimes 'tis double in its beginning; the one external which is least, and passeth to the Muscles *Rectus*, and *Vastus externus*, which extend the Leg; the other bigger and internal, which gives very many branches to the Muscles of the Thigh.

The fourth crural Vein is called *Poplitea*, arising from the same beginning, but most commonly hath two Branches uniting themselves in their progress; it descends by the middle of the Ham, and distributing Branches above and below the Calf of the Leg, is carried to the Heel, and ends in the skin of the external Ancle.

But the Crural Branch having produced these Branches, descends between the two heads of the Thigh, and produceth a double Branch, internal and external: The internal gives Branches to the Muscles, which constitute the Calf of the Leg, and giving Branches to the skin it turns back under the internal Ancle, and passeth even to the great Toe. The external is less than the former, and hath two Branches, of which, the first passeth to the Muscles of the Calf of the Leg, and those that bow the Toes: about the middle of the *Tibia* it sends a small branch to the great Toe, the fore, and middle Toe, and passing the transverse Ligament outwardly, it gives Branches to the Muscles of the Foot which bow the Toes; the other Branch after it hath dispersed Branches to the external and hinder region of the Leg, it ends in the external Ancle and Foot. The Trunk of the Crural Vein joyns its self as a companion to the Crural Artery, and sends out branches to the right and left side.

Nature

Nature hath often framed ſhutters in the Veins both of the Arms and Legs, which reſtrain the inordinate flux of blood to the extream parts.

All the Arteries of the Foot, ariſe from the Branch of the Crural Artery; for the external Iliack branch paſſing out of the *Abdomen* to the Privities, ſends a branch to the internal Iliack Muſcle, and paſſing without the *Abdomen* is called *Cruralis*; internally it produceth the Artery *Iſchias*, and the external *Muſcula*, which is carried to the external Muſcles of the Thigh, and the internal *Muſcula* which paſſeth to the poſterior and internal Muſcles thereof.

The Branch of the Crural Artery is divided into very many Branches above the Ham, of which, three or four ſmall ones paſs to the Fat, and the Membrane under it. Of theſe, that called *Poplitea* is moſt obſervable, which ariſeth about the middle of the Thigh, and is diſtributed partly to its inferior Muſcles, and partly to thoſe of the Calf of the Leg.

The Crural Branch deſcending about the Ham, gives another Artery, called *Suralis*, which ſometimes is double, and paſſeth partly to the Joynt, and partly to the Muſcle of the Calf of the Leg called *Gaſtrocnemius*. In the Ham it ſelf the Artery is divided into the external Branch, which paſſeth to the foremoſt Muſcles of the Leg, and into two hinder Branches, of which, one paſſeth to the Muſcles of the Calf, the other paſſing the tranſverſe Ligament of the Foot, is inſerted into the Muſcles adducing the Toes.

The common branch deſcending by the hinder part of the Leg, having firſt ſent out a ſmall Branch which is diſtributed to the great Toe and the back of the Foot, is at length covered with the Tendons of the Toes, and being divided into a double Branch, paſſeth to all the Toes.

The Nerves of the Foot proceed from the three inferior of the Loyns, and the four Superior pair of the *Os Sacrum*, and having firſt made a plexure, they are afterwards divided into four Branches, of which, the firſt and third are ſhorter, & not carried beyond the longitude of the Thigh: the ſecond comes to the *Tibia*, and the fourth even to the Nails of the Feet.

The firſt Branch of the Nerves ariſeth from the upper part of the plexure, deſcends to the internal *Rotator* of the Thigh, and ſends Branches to the *Faſcialis*, *Rectus*, and *Vaſtus externus*.

The ſecond deſcends by the Groyn with the Vein and Artery, and down to the Feet with the Vein *Saphena*, although in this long paſſage, it give Branches as to other places, ſo eſpecially to the Knee, the remainder of it ends in the Muſcles of the Thigh and Knee.

The third branch which is ſent from the plexure, paſſing through the hole of the *Os Pubis*, gives branches to the external *Obturators*, and the Muſcles which erect the Yard; the remainder of it is diſtributed to the ſkin of the Thigh, and the firſt and third Muſcles which bow the Leg.

The fourth is made up of the four pairs which proceed from the *Os Sacrum*, and ſecond to none in length, thickneſs, and drineſs: this verging to the lower part of the Thigh ſends a branch backwards to the

Buttocks and ſkin of the Thigh, and three others to the head of the *Muſculus Seminervoſus*, *Semimembranoſus* and *Biceps* which bow the Leg, and to the Muſcle *Triceps*, the trunk it ſelf, ſome ſmall Branches being ſent to the Thigh, to the firſt Extendor of the *Tarſus* and to the Muſcle *Plantaris*, is divided into two branches in the Cavity of the Knee, of which, the one is external, the other internal; the external paſſeth to the *Fibula*, the external Ancle, and the ſkin by diverſe Branches, and paſſing the Ligament of the *Tibia* and *Fibula*, paſſing under the tranſverſe Ligament, it paſſeth to the extenders of the Toes, and the Toes themſelves: the internal Branch paſſeth by the back-ſide of the Leg, deſcending between the Muſcles of the Calf, is diſtributed under the Ligament by the longitude of the Foot, and ſends a double Nerve to each Toe.

Nature is often various in the diſtinction of theſe Nerves, and yet alwaies obſerves its ſcope: Sometimes this Nerve of the fourth pair is divided higher above the middle of the Thigh, into the internal and external Branch; ſometimes it keeps whol even to the middle of the Leg, and ſends out internal and external Branches to the Thigh and Leg.

The cloſures of the extream parts are the Nails, which are of a middle ſubſtance between Bones and Cartilages; to the Roots of which are carried both Arteries, Veins, and Nerves, from which they have life, nouriſhment, and vigor of ſence; they equal the bigneſs of the Fingers with a decent form, and are a little bowed; they are firmly joyned to the ſkin, and in the Hands they ſerve for apprehenſion, and handling of ſmall things; in the Feet, for ſecurity and ſtrength.

And thus thou haſt the ſcope of Nature in the forming of Man, whereby the Name and Power of the moſt Wiſe CREATOR is held out, that ſo thou maieſt cry out with *Panaretes*,

HE IS ALL THINGS.

Place here the Table of the twentieth Chapter, which hath the Number 24. *at the corner of the braſs Plate.*

An EXPLANATION of the TABLE of the twenty-seventh Chapter.

AN EXPLANATION OF THE TABLE of the twenteth Chapter.

This laſt Table ſhews the Veins, Arteries, and Nerves of the extream Parts, being not carefull of the ſmalleſt branches, the huge multitude of which would obſcure the greater, and dull the Brain of the Learner: The moſt famous are delineated, ſuch as are ſhewed publickly in the Theater in Diſſection of Men of perfect age.

FIG. I.

Shews the Veins diſtributed to the Hand.

A The *axillar branch of the* Vena Cava.
BBB Vena Cephalica.
CCC Vena Baſilica.
a The *external Scapular.*
b The *branch of the* Cephalica, *which is carried to the* Deltois.
cd Branches of the Cephalica *diſtributed to the bowers of the arm.*
e The *deep branch of the* Cephalica.
ff The *internal branch of the* Cephalica *making the Median.*
g The *Median vein deſcending.*
h The Cephalica *of the Hand.*
ii The *external branch of the* Cephalica.
e The Salvatella *of the Hand.*
k The *internal Scapular.*
l The *ſuperior breaſt-vein.*
m The *inferior breaſt-vein.*
nnn The *Baſilick branches carried to the Extendors of the Cubit.*
oo The *deep branch of the* Baſilica.
p *A ſingular branch of the deep branch, which is carried out to the cubit, with the fourth pair of Nerves.*
q The *external branch of the deep baſilical.*
r The *internal branch of the ſame.*
ſ The Subcutaneus *branch of the* baſilica.
tt The *internal branch of the* Subcutaneus *branch, which with the cephalical, procureth the median.*
u *Its branch joyning it ſelf to the common vein.*
x The *external vein of the* Subcutaneus *branch of the* Baſilica.
yy The *greater branch of the external* Subcutaneus.
z The *leſſer branch of the ſame.*

FIG. II.

The Arteries diſtributed to the Arm.

A The *axillar branch of the artery.*
a The *internal ſcapular.*
b The *external ſcapular.*
c The *ſuperior Breaſt-artery.*
d The *inferior breaſt-artery.*
efg Branches of the artery diſtributed to the muſcles of the ſhoulder.
hhh Branches of the artery diſtributed to the joynt of the Elbow.
B The *external branch of the artery in the cubit.*
C The *internal branch.*
ii The *branch which is carried to the muſcles of the* Radius.
k The *branch carried to the muſcles of the* Ulna.
l m n o Branches carried from the internal branch to the wreſt, little, ring and middle finger.
pp Branches carried to the hands from the external branch.
qq r ſ Branches pertaining to the thumb, fore, and middle finger.

FIG. III.

Deſigns the Nerves diſtributed to the hand.

4 5 6 7. The *four* Vertebræ *of the Neck.*
1. The *firſt* Verbra *of the breaſt.*
a b c d The *five Nerves proceeding out of the holes of the* Vertebræ.
ff The *firſt pair of Nerves deſcending from the plexure* ☤.
gg The *ſecond pair.*
hh The *third pair.*
i i The *fourth pair bigger than the reſt.*
kk The *fift pair.*
ll The *ſixt pair which is* ſubcutaneus.

FIG. IV.

Contains the veins of the foot.

A The *crural branch of the* Vena Cava.
aaaa The *Vein* Saphena.
bbb The *branches of the* Saphena *diſtributed by the interior part of the thigh.*
cc The *Vein* Iſchias.
dd The *internal* Muſculæ.
ee The *external* Muſcula.
fff The *vein* Poplitea *conſiſting of a double beginning.*
gg The *internal branch of the crural vein.*
hh The *external branch of the ſame.*
i The *firſt branch of the external crural.*
kk The *ſecond branch of the ſame.*
ll The *remainder of the ſame.*
m The *vein of the foot called* Iſchias.

FIG. V.

Contains the Arteries of the Foot.

AAA The *crural Artery produced from the external Iliack branch of the great Artery.*
a The *artery* Pudenda.
b The *artery carried to the internal Iliack muſcle.*
c The *artery* Iſchias.
dd The *external Muſcula.*
e The *internal Muſcula.*
ffff The *arteries diſtributed to the membrane and fat.*
gg The *artery* Poplitea.
hh The *arteries called Surals.*
ii The *foremoſt branch of the crural artery.*
kk The *firſt hindmoſt branch of the ſame.*
ll The *ſecond hindermoſt branch of the ſame.*

FIG. VI.

Repreſents the Nerves of the Foot.

2.3.4.5. The *four* Vertebræ *of the Loyns.*
66 The Os Sacrum.
A *A pair of Nerves pertaining to the tranverſe muſcles of the* Abdomen.
BB The *firſt pair of Nerves of the foot.*
CC The *ſecond pair.*
aaa *A branch of the ſame which accompanies the* Saphena.
bb The *remainder of the ſame branch.*
DD The *third pair of of the Nerves of the foot.*
EEE The *fourth pair, which is the greateſt.*
c *Its Branch which turns back to the Buttocks and skin of the thigh.*
ddd Branches ſent to the bowers of the leg.
eeee Branches ſent to the bowers of the Thigh.
f *A branch ſent to the muſcle* Plantaris *and the extenders of the* Tarſus.
g.h Two *external branches ſent to the toes and the muſcles of the* Fibula.
i The *internal branch carried to the great and ſecond toe.*
k.l The *internal branches ſent to the ſural muſcles.*
m The *remainder of the Nerve of the ſixt pair, diſperſed by a double branch under the foot to the toes.*

FIG. VII

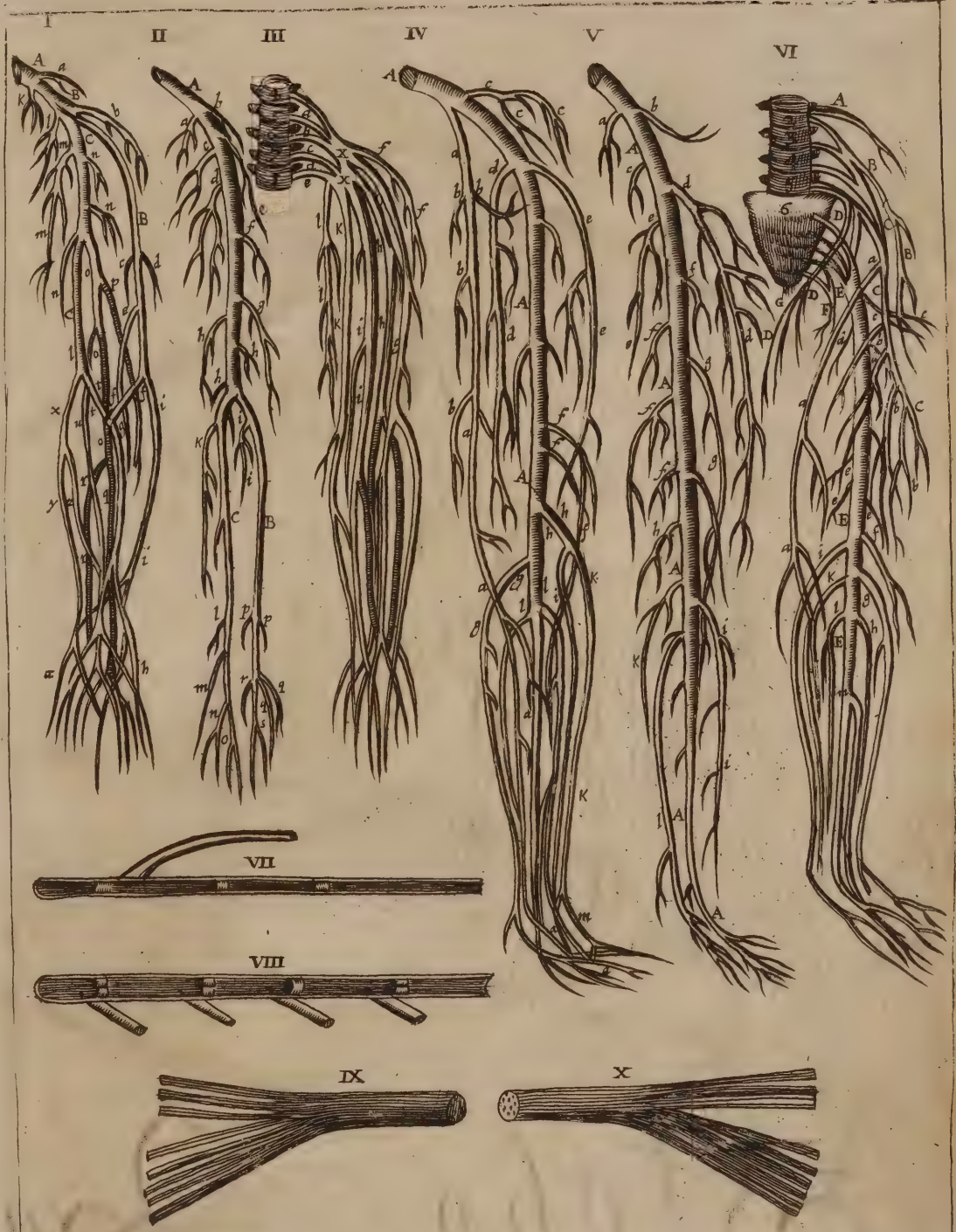
Shews the *Baſilica* vein open, in which three ſhutters appear.

FIG. VIII.

Shews a branch of the crural vein open, and three double, and one ſingle ſhutter.

FIG. IX. and X.

Shew a portion of the Nerve of the fourth pair divided into ſmal Nerves like threeds, in gathering togeather of which, the wonderful power of Nature appears.


I
II
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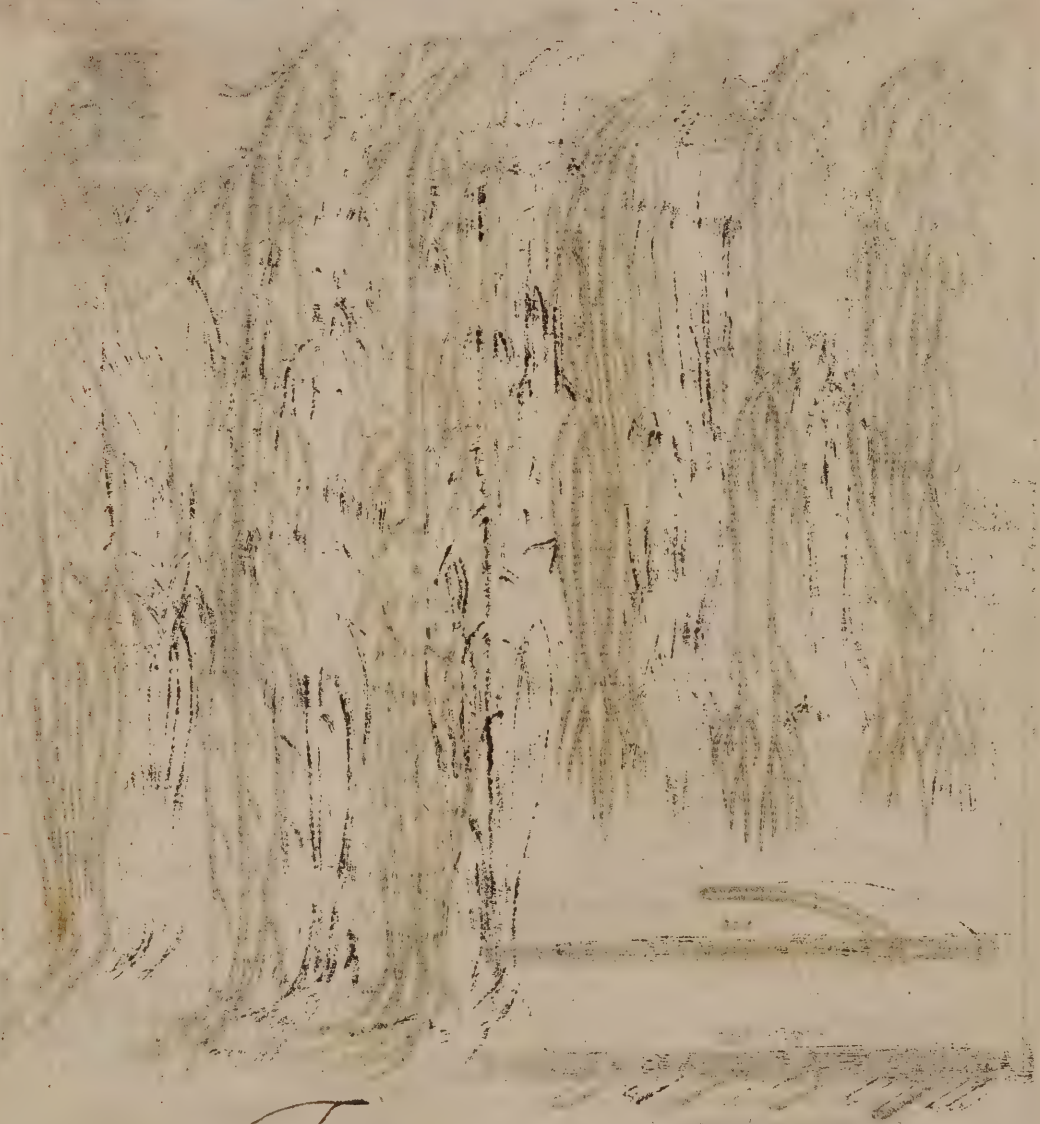

John Branson
His Booke
1689